Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

Pretty blonde Peggy Hazard is an unusual girl. Bugs and worms don't scare her. Employed by Bell Telephone Laboratories, she conducts complex biological tests on retrieved ocean cable which may have been attacked by pests such as the burrowing clam or terado worm. Peg is shown with a cable vault where some samples of damaged cable are kept. See Woman's Page on p. 50.

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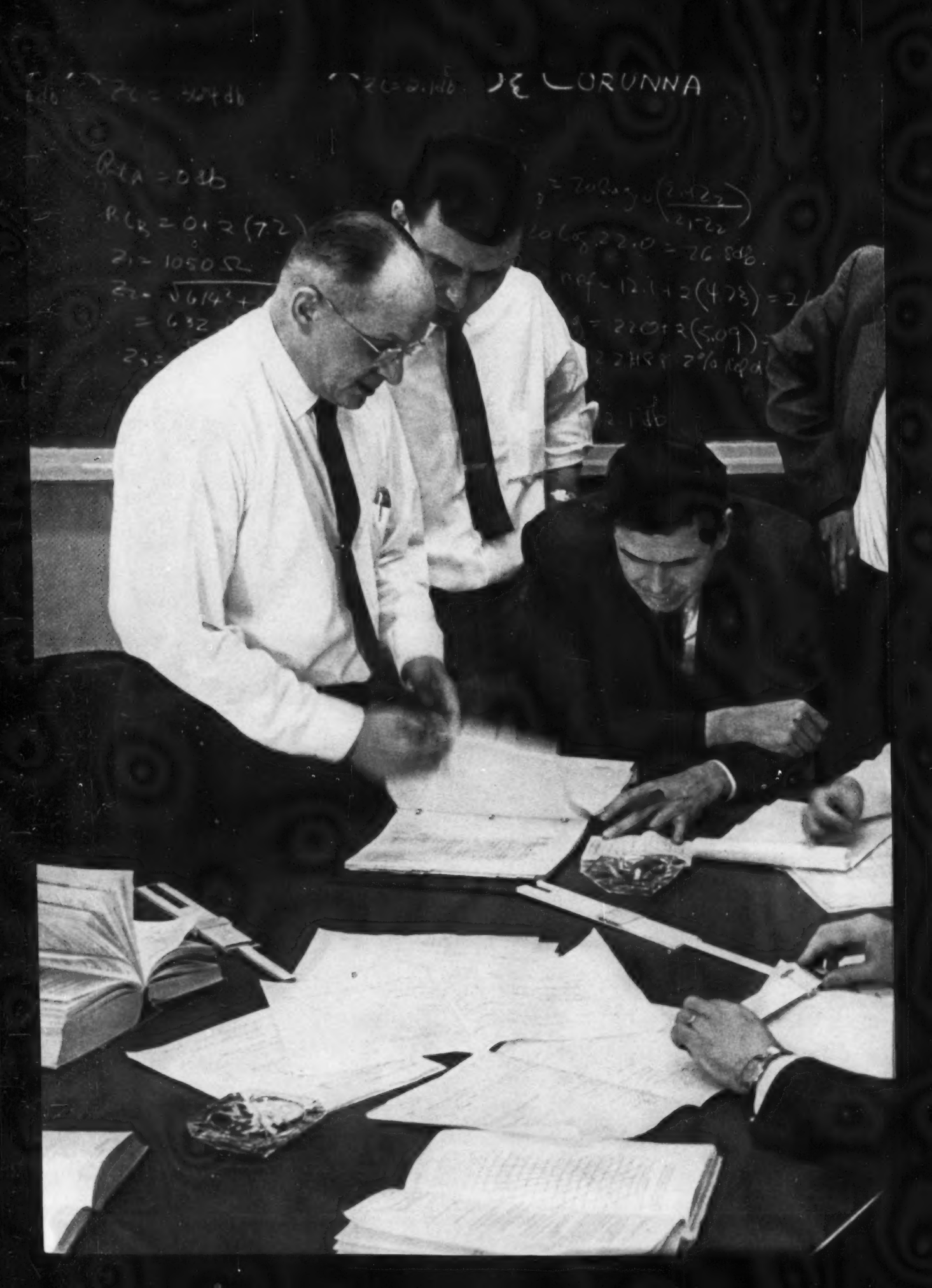
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FLASHES AND PLUGS

ZOO-PERATION. Officials at Picatinny Arsenal, Dover, N. J., were puzzled when it was discovered interlopers had knocked out the arsenal's communication system. Communications being often called the nation's first line of defense, this was admittedly cause for consternation.

Telephone men will recognize the seriousness of penetrating the ¼-inch lead sleeves protecting the telephone wires, which was happening at the arsenal. The commissary, the enlisted men's lounge, and an office building also had been attacked at various times by interlopers.

Well, what really happened, according to a dispatch to the New York "Times", was this:

A band of squirrels had gnawed through the lead sleeves, while others of their tribe raided the nursery's candy and cooky supply.

A pair of raccoons raided the lounge and carried off a box of crackers.

A field mouse produced panic and hysteria when it sneaked into the office building and put civilian secretaries to flight.

And—dramatically, a deer leaped through a plate-glass window.

•

IT'S NO MERE BRAIN! This conversation is conceived as having taken place between an Army general and an electronic brain.

At the Pentagon the general went to the automatic data processing room in search of important information. He toyed with the largest and most sophisticated electronic machine and received several routine answers from it.

The general then asked the big question: "What about World War III?"

The machine clanged, lights flashed on, bells rang, and it spit out this one-word answer: "Yes!"

His curiosity aroused, the general could hardly wait to ask the machine: "Yes, what?"

The machine promptly answered: "Yes, SIR!"—Jerry Kluttz in the Washington "Post".

•

LIMBO? ANAHEIM? AZUSA? A contributor to "Pepper and Salt" in the "Wall Street Journal" offered this gem.

An executive who was swamped with work called the office switchboard operator.

"Look, Miss Jones," he said, "don't put through any calls to me this morning. I'll be incommunicado."

"Well, all right," she replied, doubtfully. "But in case anything very important comes up, hadn't you better let me have your number there?"

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

SINCE 1901

February 24, 1962

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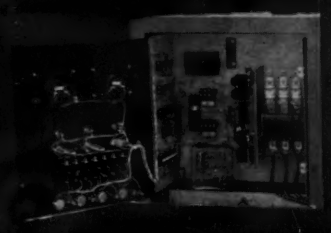

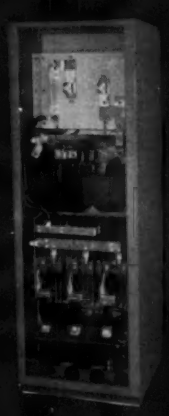

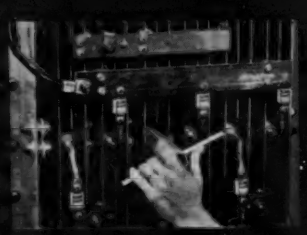

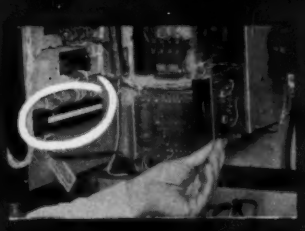

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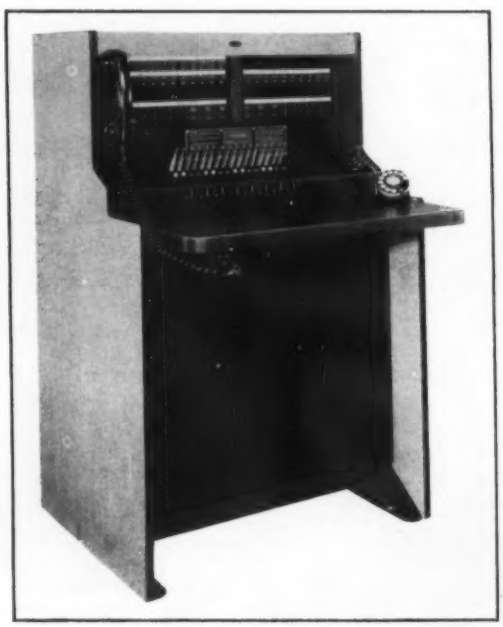

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All terminals, repeaters and power supplies are completely transistorized. Eliminates need for AC power supply at central office terminal. Power requirements are low . . . less than 5 watts per channel, including dropping resistor, at central office . . . from 2.4 to 3.6 watts at subscriber terminals.

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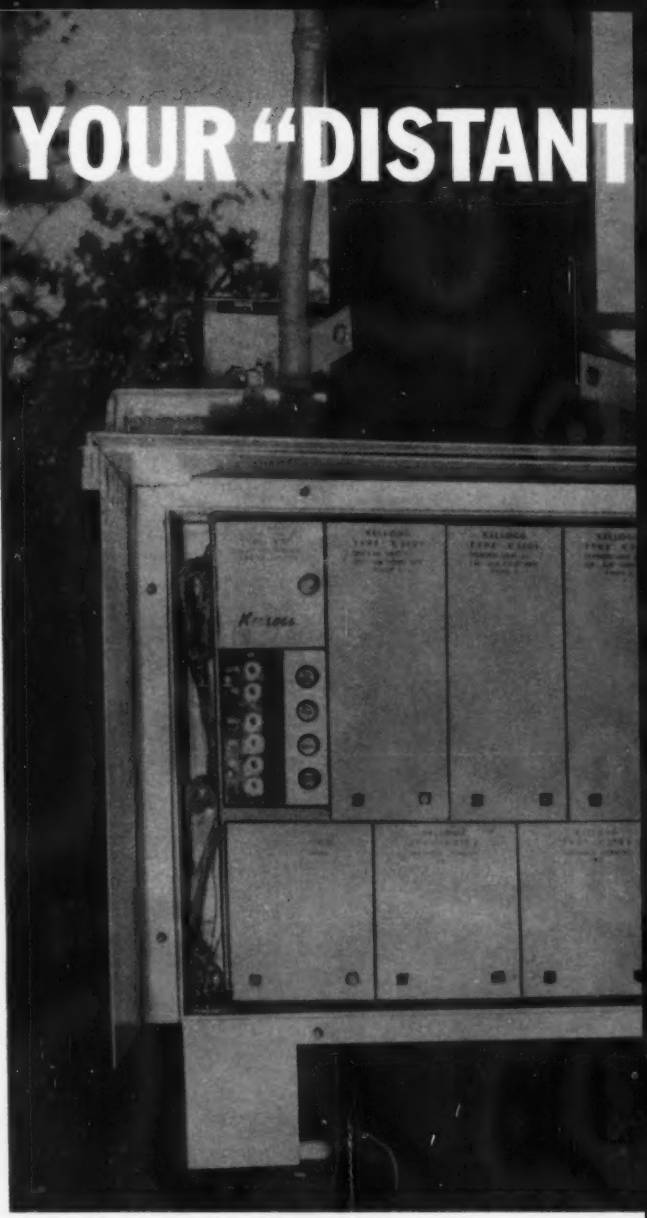
The K-31 System may be used with most central office dialing equipment which provides selective or semi-selective multi-party ringing. Signaling sub-assemblies are available to provide frequency selective, divided or bridge coded, or superimposed ringing.



Typical 8-channel K-31 Subscriber Terminal Installation

Basic equipment

Basic equipment consists of central office carrier terminal, powered by —24 or —48 VDC battery, and the subscriber carrier terminal with stand-by power supply. K-31 repeaters permit operation over long entrance cables, buried plant or extended lengths of iron wire. One repeater nearly doubles operational mileage; two repeaters triple it, etc.

Paystation and private line options

A special signaling option may be equipped, in any of the channels, to provide reversed battery supervision for semi-postpay paystation operation. A similar arrangement is available for lower cost private line use.

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Semi-Postpay Paystation Terminal

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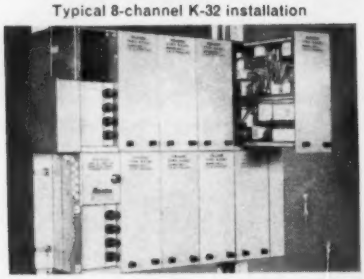

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The K-32 provides low-cost open-wire trunk carrier service between two central offices with up to eight separate voice channels on each single-cable or open-wire pair. It is ideally suited for additional trunk service between end-link toll offices or between offices in the same free service area.

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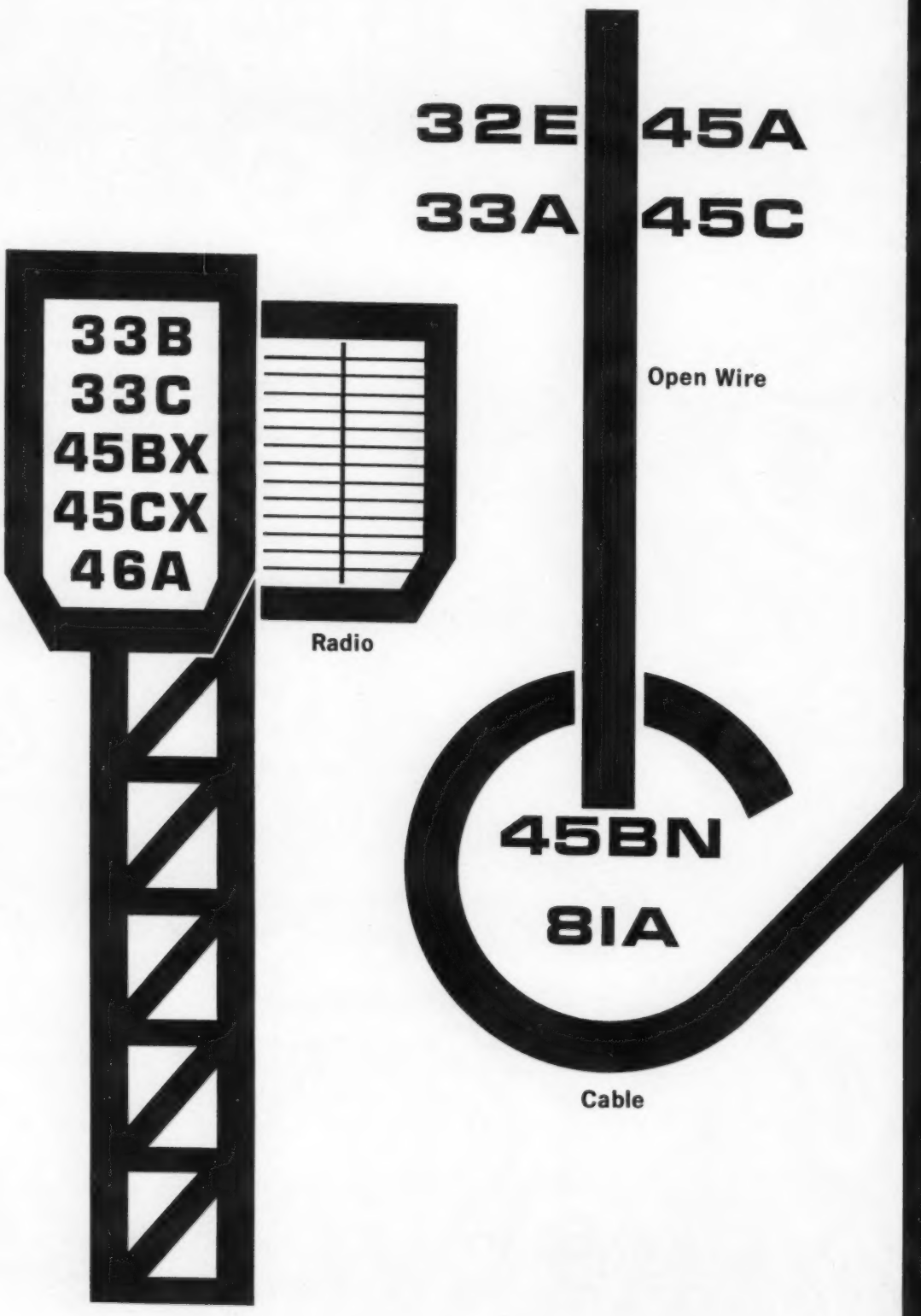

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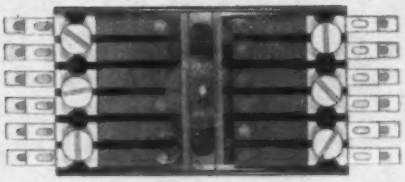
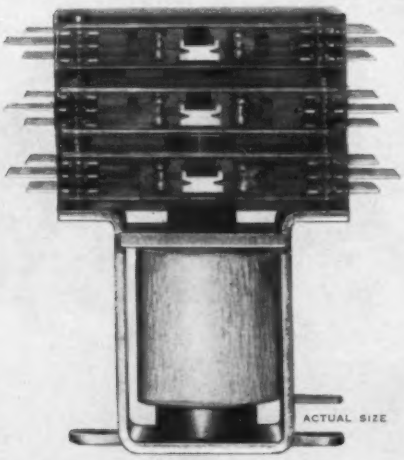


This dust-tight, see-thru wafer has 12 circuits.



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The main objective of this training program is to simplify the sales and service aspects of all Electronic Secretary products. Telephone companies which have already benefited from the course, inform us that their personnel are now equipped to do a much better job in handling this line of telephone answering equipment. They also report that sales come easier because of their thorough knowledge of the equipment.

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General Field Manager
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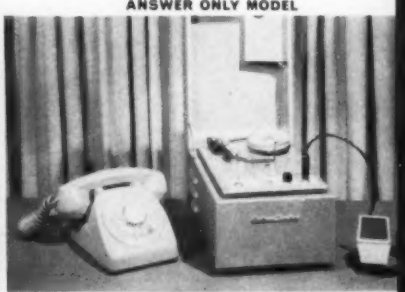

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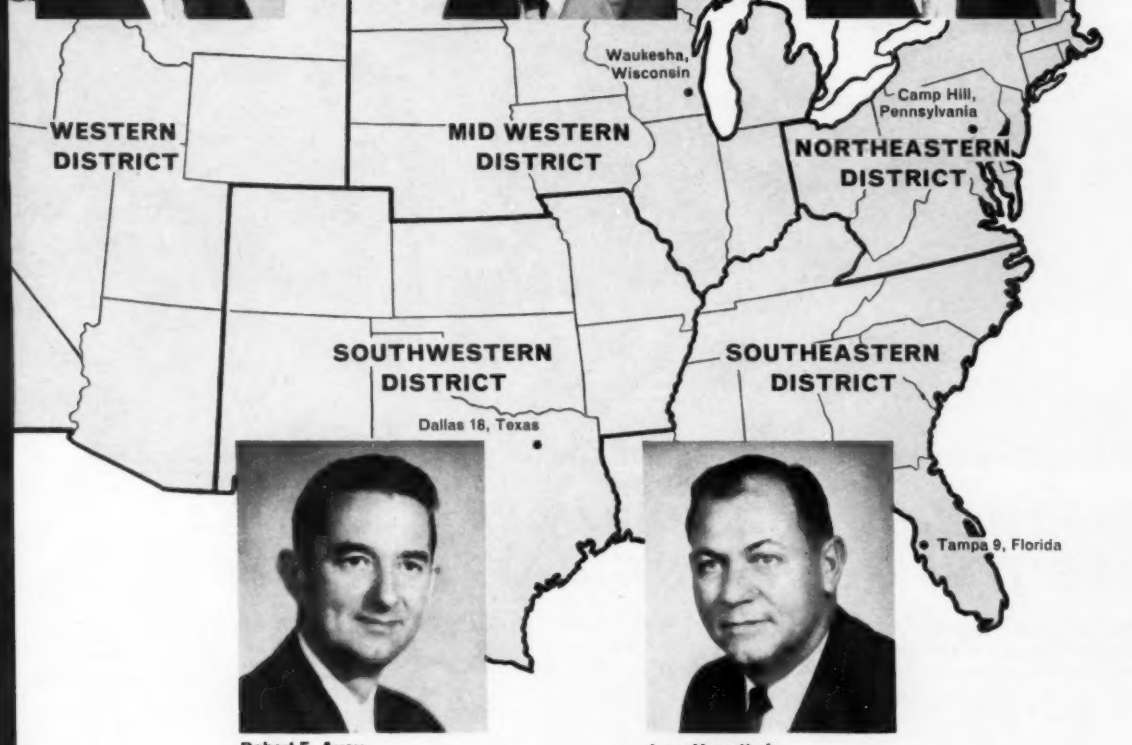

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IN THE NATION'S CAPITAL

BY LAWRENCE J. HOGAN, WASHINGTON EDITOR
and President, Larry Hogan Associates,
Public Relations Firm.

CWA to press for 3.5 per cent wage increase. FCC proposes fees for processing applications of common carriers. REA officials to testify on single loan account. Status of major bills in Congress.

WALTER W. Heller, chairman of the President's Council of Economic Advisors, addressed a collective bargaining convention of the Communications Workers of America (CWA) in Washington on Feb. 12. Press reports indicated that Heller urged the union to exercise restraint in its wage increase demands. He discussed the President's call for responsible wage negotiations and no inflationary settlements.

Heller spoke at the closed door session of CWA's 59-member collective bargaining policy committee which had assembled to draft the union's demands for the coming year.

Union sources have indicated that Heller repeated the administration's plea for holding wage increases within productivity advances, which the council has averaged at 3 per cent per year in major industries since the end of World War II.

TWO DAYS later Joseph A. Beirne, president of CWA, announced the union's 1962 wage demands which he claimed were in line with the President's call for restraint. Beirne said the union would seek average 3.5 per cent wage increases plus additional money in the package to correct "thousands of inequities."

At a press conference announcing the demands, Beirne made reference to Heller's speech and said that the President's top economic advisor had told the group that wage increases ranging from 2.5 to 3.5 per cent generally would not be inflationary, since they were within the average productivity gain for the nation.

If Beirne was accurately quoting Heller it is a strange situation indeed. It is perhaps the first time in history when a top government official has told a union what it feels the maximum limits of collective bargaining should be.

ON VALENTINE'S DAY, the day before Beirne made his announcement, President Kennedy saw the committee —which represents 375,000 voters— and gently reminded them of their responsibility to the national interest in setting their wage goals.

Greeting the group in the Rose Garden of the White House, the President said, "I am an old friend of your president, Joe Beirne. In 1947, he and I were two of the 10 outstanding young men, according to the Junior Chamber of Commerce. But I do also want to welcome you because yours is an outstanding union, and I am a great believer in the contribution which the union movement can make, not only in this country in maintaining a progressive economy, but also the contribution which the union movement can make around the world.

"I stated to the AFL-CIO national convention that the efforts which the AFL-CIO have made around the world to strengthen the free democratic trade union movement I believe represented one of the great contributions in the struggle against the communist advance which has been made in the last 15 to 20 years.

"I WANT to commend you. I know you are here in Washington taking part in one of the most important assignments which faces your union, to make a determination of what you should do in regard to collective bargaining. I know that Dr. Heller had an opportunity to talk with you yesterday. I want to commend you for the responsible way that you are moving towards your assignment.

"We are all concerned not only with advancing the public interest—you have a responsibility towards your members and towards the country, and I am sure that you are going to meet your responsibility to both of these— to your people and to all the American people in maintaining our economy in a way which protects our people, and makes it more possible for them to participate more fully in our lives here.

"I WELCOME you to the White House. It belongs to all of you. I welcome you here individually and also because you represent an outstanding American organization, and also because of your distinguished president, whom I regard as one of the outstanding leaders of the American labor movement today. Joe, we are glad to have you all here."

Beirne unfolded his wage plans the next day with the comment, "We are confident that with the guidelines provided by the administration and the desire of the industry to reach a peaceful understanding, we can make an agreement without a strike."

FCC Proposes Licensing Fees

The Federal Communications Commission has proposed the establishment of fees for processing applications from radio and television stations and telephone companies, which would result in estimated annual revenues of 7.5 million dollars, more than half of FCC's operating budget. (The President has asked for 13.1 million dollars to operate FCC during fiscal year 1963 which begins July 1. Its budget for fiscal year 1962 is $12,525,000 and for fiscal year 1961 it was $13,085,000.)

The commission, by a 4-3 vote approved the licensing arrangement

which has been a pet project of FCC Chairman Newton Minow.

The fee schedule ranges from $2.00 for a commercial radio operator's license to $250 charged for an international telephone or telegraph carrier to lay an underseas cable.

Interested parties have been given until Apr. 16 to comment on the proposed new fee schedule. After FCC has had an opportunity to study and reply to these comments, the new fees will be put into effect.

Back in 1953, the Budget Bureau asked various administrative agencies to draw up fee schedules for their services, but thereafter the Senate Interstate and Foreign Commerce Committee asked FCC to shelf the arrangement.

Proposed fees pertinent to telephone companies are as follows:

Common Carrier—Applications for initial construction permit (no additional charge for license to cover):

Domestic Public Land Mobile (including mobile units)	$150
Point-to-Point Microwave	100
Local TV Transmission	50
Rural and Domestic Public Land Mobile (individual user units)	10
International Fixed Public (additional transmitter)	150
International Fixed Public (transmitter replacement)	50
Other common carrier CP applications	10

Common Carrier—Applications for license renewals:

Domestic Public Land Mobile (including mobile units)	$ 75
Point-to-Point Microwave	50
Local TV Transmission	25
Rural and Domestic Public Land Mobile (individual user units)	5
International Fixed Public	75
Other common carrier renewals	5

Common Carrier—Other applications:

Section 214 telephone company extensions	$100
Section 214 telegraph company extensions	25
Section 221 telephone company consolidations and acquisitions	50
Interlocking directorates	10
Cable landing license applications	250
Other common carrier non radio applications	10

For filing applications in all *experimental* services a fee of $20 is proposed, but comments are elicited *as to whether this* is an appropriate amount.

In a statement accompanying the fee schedule FCC said:

"The commission's current action is pursuant to a Budget Bureau circular of Sept. 23, 1959, implementing provisions of the Independent Offices Appropriation Act of 1952 to effectuate government policy that the recipients of special benefits from a federal agency should pay a reasonable charge.

"The commission is, accordingly, proposing fees to recoup for the government a portion of its cost of regulating the communications industry. In arriving at the proposed schedule, the commission selected those services provided by it which are readily identifiable and assigned to each a fair and equitable assessment, taking into consideration cost to the government, value to the recipient, public policy or interest served, and other pertinent facts."

REA Approves Two Loans

The Rural Electrification Administration has approved loans amounting to $210,000 to telephone systems in California and Oklahoma, as follows:

The Colfax (Cal.) Telephone Exchange; $155,000; Feb. 5.

With the aid of this loan, the exchange plans to furnish initial service to 155 subscribers.

The borrower plans to create a new exchange at Weimar, construct a new dial central office there, and install facilities which will improve service for the whole system. In addition, the company is considering service without toll charge between its two exchanges—Colfax and Weimar.

REA loans to the Colfax Exchange will help make possible new and improved service to 1,055 subscribers. Approximately 790 subscribers now receive dial service through the Colfax central office.

•

Oklahoma Automatic Telephone Co., McAlester; $55,000; Feb. 5.

The company intends to use these funds to help finance improvements to the system which will result in better service for the subscribers, and to complete the system authorized under prior loans.

Loans to the Oklahoma company will help enable it to bring new and improved service to 1,285 subscribers. The 10 exchanges of the system now furnish dial service to approximately 1,175 subscribers.

REA Officials to Testify

REA officials are expected to testify before the House Committee on Agriculture on a section of H. R. 10010, which is known as the Administration's Food and Agriculture Act of 1962.

The bill contains a Section 502 which would establish a single loan account which would be made up by consolidating all outstanding telephone and electrification loan financing by the REA. All REA loan authorizations, as well as all REA collections of principal and interest, would be included. And the REA, in turn, would be authorized to pay out of the account the principal and interest on treasury notes. It would create in effect a revolving fund. Balances would be made available for loans and advances to the extent determined by Congress.

The Senate Agriculture Committee opened hearings Feb. 20 on the Senate's version of the bill, S. 2786.

Status of Major Bills in Congress

EDUCATION: President Kennedy sent a message to Congress saying it was "imperative" that Congress approve a 5.7 billion dollar, five-year education program including federal funds for public schools and teachers' salaries. His request included 2.1 billion dollars for general aid to education; 7.4 million dollars to improve the quality of education through special teachers' scholarships and retraining programs; 2.1 billion for college construction and scholarships for 200,000 students a year; 600 million dollars for a medical and dental school building program plus scholarships for students in those specialty fields. Bills already are being considered for most of his recommendations. The Senate passed H. R. 8900 carrying Senate language which provides a five-year, 2 billion dollar program of scholarships and loans and grants to colleges for classrooms and other academic buildings.

URBAN AFFAIRS: The House Government Operations Committee began hearings on Feb. 6 on the President's reorganization plan to create a new Department of Urban Affairs. A bill (H. R. 8429) for the new agency was killed by the House Rules Committee, so the President came right back with a reorganization plan, which would become effective in 60 days unless either the Senate or House vetoed it. Hearings are on resolutions to reject the plan. The House committee is considering

(Continued on page 58)

Trouble Clearing

Central Office Protection

By L. N. MARTIN

SEVERAL OF our recent articles discussed the protection of outside plant and station equipment against damage by lightning and power crosses. A discussion of central office protection would seem to be in order. However, this is a matter in which the average small company has little choice.

The very large companies do their own central office engineering and the equipment is manufactured according to their specifications.

However, the average telephone company purchases a new board with the protective features built in. The main frame and its protectors are usually purchased from the same supplier, although the M.D.F. protectors are probably made by another company. The new equipment is installed by the manufacturer (as it should be). Therefore, the operating company has little to do with it.

However, small companies may sometimes undertake the installation of small boards themselves. Or they may install additions to existing boards. This being the case, they should understand the protective features associated with their equipment in order to maintain it, and it must be remembered that protective equipment can, itself, get out of order. Therefore, we believe that a discussion of this subject may be helpful to the smaller companies.

Most telephone men will agree that the telephone office is the safest place in town during an electrical storm. We have not seen any statistics on this subject, but in a long telephone experience we have never heard of a person being killed by lightning while in a telephone office. On the other hand, reports of lightning fatalities in homes are not uncommon.

The reason that the telephone office is a safe shelter from lightning is that it is filled from the floor to near the ceiling with well-grounded metal work. A manual switchboard may appear to be mostly wood, but this wood work consists of panels attached to a well grounded iron or steel frame. The only metal part of a manual board that should never be grounded is the iron or brass foot rails. Good central office grounding is very important for a number of reasons.

PART 84. The preceding article in this series appeared in the Dec. 2, 1961 issue.

Is your office well grounded? If it was installed under the direction of an engineer from the manufacturer, or any other qualified equipment engineer, it was properly grounded. The main ground is probably still good, but some of the connections may have developed high resistance. This may show up in faulty operation of some of the equipment due to "back up".

If a river is dammed, the water above the dam will back up some of the tributaries. The same thing occurs when an open or a high resistance develops in a ground wire. In the old days, when we had magneto offices with grounded lines, an open or high resistance central office ground would apparently cross up every line on the board. In a common battery manual office "false busy test" is often the first indication of a faulty grounding system.

Central office ground wires are of large gauge and they terminate on copper bus bars. A copper lug or terminal is attached to the end of the wire by filling the sleeve of the lug with molten solder and inserting the well-tinned end of the wire. Then the lug is attached to the bus bar by a copper stud bolt. There is always a chance for a poor connection to develop in these connections.

Preventive measures include tightening all stud bolts periodically, using a socket wrench. The connections should also be tested with a milliammeter. The meter is bridged around the connection to be tested. If the meter indicates any current flow, the connection is defective.

The central office equipment is protected from lightning and foreign power that may come in via the outside cable pairs, by the main frame protectors. These are pretty well standardized and consist of a pair of open space cut-outs (carbon block protector) and a pair of heat coils for each cable pair. The protector blocks are usually the same as those used in station protectors and have been discussed in previous articles.

The heat coil is an ingenious device. It protects the central office equipment against currents which, if continued for some time, may heat and damage relay windings and other equipment, even though the voltage of such currents may not be high enough to operate a carbon protector. It is a delayed action device that operates on current rather than voltage.

There are many delayed action devices in the central office, such as the solenoid with dash pot or the timing relay chain. These would be entirely too expensive for use on each cable pair. The heat coil is a simple and inexpensive device that accomplishes the same purpose.

A coil of resistance wire is wound around a metal core (usually copper or brass) and this coil is in series with the line. Current flowing through the coil heats the core, but in the case of normal telephone current this heat is dissipated as fast as it forms. When currents larger than normal flow through the coil, more heat is developed than can escape and, in time, the core becomes hot enough to melt a small amount of soft solder. This releases a spring which actuates the protector. The stronger the current through the coil, the more rapidly the heat accumulates. Therefore, a current which is only slightly above normal will not melt the solder until several minutes have elapsed, while

(Continued on page 22)

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A NEW MARCHING THEME
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Let your fingers do the walking!

A walk through the Yellow Pages is already the way most people learn of products and services, of brands, special features, store hours, and other helpful buying information.

In 1962 more millions of tired feet will rest if the shoppers who own them take the step-saving advice offered by the new Yellow Pages advertising theme of "Let your fingers do the walking!"

Beginning late this month, shoppers across the nation will see this message for the Yellow Pages in Time, Life, Look, The Saturday Evening Post, and Better Homes and Gardens.

The selling effects of this new Yellow Pages theme will benefit directory salesmen everywhere.

BELL TELEPHONE SYSTEM

a strong current may operate the protector within a few seconds.

When the spring is released by the melting of the solder, that side of the line is grounded. In some types of protectors, release of the spring also opens the line towards the switchboard. Some protectors have another set of contact springs which actuate an alarm circuit. A guard lamp at the top of the vertical is lighted and the "heat coil alarm" bell is sounded. This is a desirable feature. Many of the causes of heat coil operation are transient in nature and if the coil is quickly replaced or reset, the subscriber may not discover that his telephone was out of order. Therefore (from the subscriber's viewpoint), there was no trouble.

In some types of heat coil protectors, the winding, core, a metal sleeve, and the solder form a small unit which after operation is discarded and replaced with a new one. In others, the protector may be reset by the use of a hot soldering copper. In still others the protector may be reset several times without the use of tools.

Since the heat coil protector includes a coil in each side of the line, it increases the line resistance and the transmission loss of the central office. This small loss is included in the computed central office loss. If two or more heat coil protectors are inserted in one line circuit, it causes an extra loss that, in the case of a long line, could cause the line to exceed the transmission or resistance limits of the office. As will be discussed later, this is a possibility in some offices.

There are two types of main frames. In the "A" type (the older type), the protectors are on the switchboard side of the frame. The outside cable pairs are connected to punchings on the horizontal side of the frame. On the "B" type frame, the protectors are connected to the outside cable pairs while the cables to the switchboard are connected to punchings on the other side of the frame.

The A-type frame is no longer installed in new offices but there are probably many of them still in service. This type of frame has many faults or disadvantages. However, if it is properly used there is no reason for replacing it while it is still serviceable.

The disadvantages of the type A frame are:

(1) Vacant cable pairs are not connected to a protector and it has been found that it is very important to protect or ground all vacant pairs.

(2) A line which loops through the office without going to the switchboard or other equipment (such as a private line or a PBX off-premise extension) is not connected to a protector.

"SOMETHING TELLS ME LOCKSLY'S NOT CUT OUT FOR THIS TYPE OF WORK."

(3) If equipment is to be connected between the outside cable pair and the switchboard (repeating coil, long line equipment, etc.) it is not protected and the protector on the switchboard side of the equipment is useless.

(4) An excessive voltage coming from the outside has to pass through the M.D.F. jumper before reaching the protector. This gives it more chance to cause damage.

The type "B" frame has none of these faults. Every outside pair is protected, whether working or not, and no further protection is needed. Nevertheless most of the objectionable features of the type "A" frame may be overcome.

Let's discuss the above listed objections to the A-type frame:

OBJECTION 1. Vacant pairs not protected. Grounding strips may be attached to the lower part of the fanning block on the horizontal side of the frame. These are metal strips about three-fourths inch wide with punching along the upper edge. These punchings are so spaced that each punching on the ground strip is just below a pair of punchings to which the jumper is attached, if the pair is working.

At each vacant pair, a piece of bare tinned copper wire is wound around both of the jumper punchings and the grounding punching. This wire is not soldered. If a number of vacant pairs are adjacent, a length of the bare wire is woven back and forth between the jumper punchings and the ground punching. The ground strip is connected to the M.D.F. ground. Thus, all vacant pairs are kept grounded. The bare wire is removed when a pair is to be used and care must be taken to place this wire each time a pair is vacated.

OBJECTION 2. A line looping through the office. A number of spare protectors must be mounted on the vertical side of the frame for this and other purposes. No cable is connected to these protectors. Jumper the two pairs together, then run a second jumper from one pair to the jumper punchings of a spare protector. Only one protector is used, and the heat coil portion of this protector is not used and not needed.

OBJECTION 3. Auxiliary equipment. This is handled in various ways. The objective is to have a protector on the line side of the equipment, and no protector between the auxiliary equipment and the switchboard, or between items of auxiliary equipment. Such auxiliary equipment usually terminates in punchings which may be on either side of the M.D.F.

A jumper is run from the cable pair to a spare protector and another jumper from the inside terminals of that protector (where cable is ordinarily attached) to the line terminals of the auxiliary equipment. Another jumper is run from the switchboard or inside terminals of the auxiliary equipment to the protector associated with the switchboard line to be used.

This leaves a second protector in the circuit which is useless in that position and which can cause a transmission loss or other trouble. This protector is then disabled. This is done by replacing each pair of carbon blocks with a wood block made for that purpose and by replacing the heat coils with metal blanks provided for that purpose. With some types of heat coil protectors, it may be necessary to short out the heat coil windings.

We have seen offices with type A frames in which the line side of all auxiliary equipment was terminated on a protector. In this case, a spare protector is not used. Otherwise the circuit is wired as in the foregoing. Sometimes two or more items of auxiliary equipment are to be used in tandem. In this case, there may be several protectors that must be disabled.

OBJECTION 4. Cable pair and protector are separated by a long jumper. We know of no way to help this situation.

A protector for use on a type A frame differs from a protector to be used on a B-type frame in the arrangement of the punchings to which the cable pair and the jumper are attached. A protector always must be connected so the carbon blocks are towards the line and the heat coils are towards the switchboard. Other-

(Continued on page 57)

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POLITICS is everybody's business

By T. A. SAUNDERS*

FOR MANY years, staying out of politics was a traditional position of utility personnel, including General Telephone Co. of Michigan. This stand has, in many instances, been an unwritten company policy. Political involvement by company employes, it was felt, might directly or indirectly harm the company's position with customers and governmental units, even though the employe would be acting on a bi-partisan basis as an individual and not as a company representative.

The doubts which nurtured this policy were possibly not too realistic. To name the most important:

(1) Customers of opposite political beliefs may react unfavorably toward the company when a company employe is active, politically, in the "other" party.

(2) Employes may harbor ill-will toward the company if a member of management is active in the "other" political party.

(3) Businessmen and their employes should stay out of politics. This thinking, although not always justified by logic or facts, evolved from the publicly popular "anti-business" attacks by many politicians during and following the depression. In other words, businessmen, as a whole, decided to "pull in their horns" rather than stay in the political arena and risk criticism.

(4) The actions of employes involved as individuals in politics might have a detrimental influence on the thinking of governmental bodies toward the company.

WE CAME to realize that it would be more harmful for us to turn our backs on politics than it would be to encourage participation in politics by our employes as individuals.

Our new thinking has been prompted by what we feel has been an objective evaluation of the "old fears."

A no-nonsense view of employes in politics produced these facts:

(1) Every citizen has a right and a responsibility to participate in politics.

(2) Others respect those who have the courage to stand up for what they believe.

(3) Just as most people are tolerant of others' religious beliefs, generally they are tolerant of opposite political points of view and the other person's right to express those views and try to win support for them.

(4) As for businesses insisting their employes remain aloof of politics to keep the company out of line of ricocheted criticism—it may work for a while. But, just as taking your team off the football field will keep them from getting hurt, it won't win the game.

ECONOMIC TRUTH in this country has, at times, taken a terrible beating. Business people have been too cautious or too busy to sell the benefits of the American private enterprise system, and yet we all know that this sytem has provided a far better and more equal distribution of wealth than any other system yet devised by man. People in our country have more food, shelter and comforts than other nations, by a wide margin. With this material welfare has also come increased leisure time which can be used for education, self-improvement, and cultural and recreational opportunities.

T. A. SAUNDERS

Businessmen must be more active in politics, first as citizens and, secondly, as professionals with special knowledge. As a citizen in our democracy, everyone has a right to voice his views about the selection of candidates who will write laws and make decisions that will affect his life and his freedom. With the right to voice opinions goes the corollary responsibility of seeing that the opinions are heard by the people who can do something about them.

Further, that action includes the work of selecting party candidates, not just making a choice between two party candidates who were selected by someone else. Each person, because of his unique outside interests and interrelationships with many people, can contribute understanding and knowledge to the solution of our governmental problems.

AS PROFESSIONALS, businessmen must be more active politically to further economic understanding, to volunteer their organizational and professional skills to the operation of government and to see that the revenues collected on the 52 per cent tax on business earnings are being efficiently and widely used.

Improving the understanding of economics, in general, and of our American private enterprise system, is probably the most neglected, yet most important, job that businessmen need to accomplish. With a better understanding of the very system that has produced the greatest prosperity and security ever known to mankind, Americans will be alert for needlessly restrictive and unreasonable taxes and ideas which are detrimental to their own self-interest—ideas that eat at the foundation of our American system.

Robert M. LaFollette once said, "Politics is economics in action." Some reflection on that statement reveals its truth. One of the major issues during the 1960 presidential campaign was the rate of growth of our economy. In our state, the key question in the gubernatorial race was how to attract business and industry here so thousands of new jobs could be provided for our expanding work force. In Greater Muskegon, the headquarters of

(Continued on page 55)

*Reprinted from "Challenge," publication of the Michigan State Chamber of Commerce. Mr. Saunders is President of General Telephone Co. of Michigan, Muskgon; immediate past president of the Greater Muskegon Chamber of Commerce and a director of Michigan State Chamber of Commerce.

TELEPHONY'S ELECTRONICS SECTION

BY PAUL E. MURPHY, ELECTRONICS EDITOR

CARRIER TECHNIQUES

NEW CARRIER products continue to be developed and manufactured to meet the increased demand for larger quantities and improved characteristics of telephone communication facilities.

A recent development in carrier techniques has been provided by Panhandle Electric Sales Co. The development provides an all-transistorized 12-channel cable carrier system designed to be fully compatible with and an equivalent to the Western Electric type "N" carrier system. The new system has been designated "LN".

Panhandle's main objectives were: the design of a system needing less maintenance and one with longer life; simplified alignment and testing procedures; and, finally, operation from normally supplied, central office, 48-volt battery, thus eliminating the necessity of additional supply voltages that would ordinarily be obtained from additional battery strings of $\pm$130 volts. The end results are considerable savings in floor space, additional air conditioning facilities, and lower power consumption.

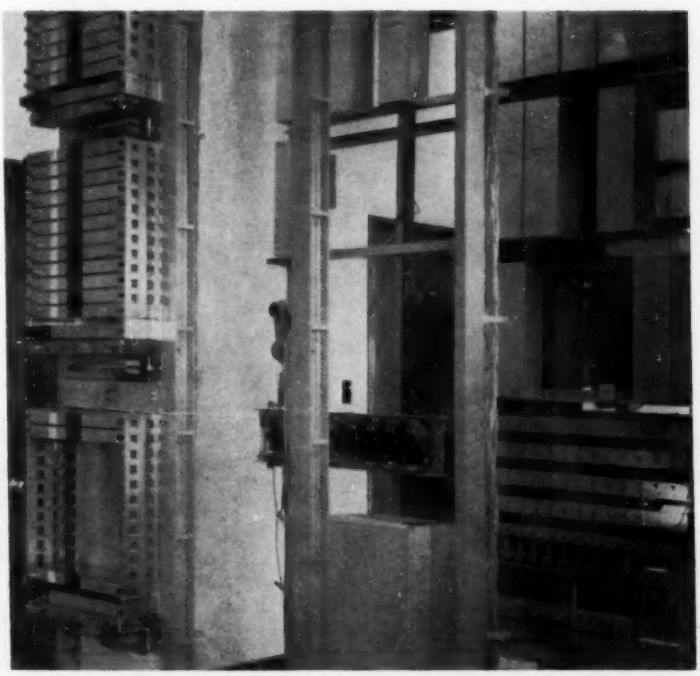
Since the "LN" design has been made compatible with Western Electric "N" system for use on short-haul toll and exchange-type cables the same basic specifications apply.

Channel carriers are spaced at 8-kilocycle intervals and double sideband transmission is employed. Two cable pairs are utilized, one for each direction of transmission, providing directional separation. A different frequency band is also provided in each direction of transmission. Frequencies in one direction are 44 kc to 140 kc, with carriers at 8-kc intervals from 48 kc to 136 kc. In the other direction, frequencies appear in the range of 164 kc to 260 kc, with carriers at 8-kc intervals from 168 kc to 256 kc. Crystal-controlled oscillators are utilized to generate all carrier frequencies and are a part of the particular channel terminal unit transmitter.

Also included as a part of the channel terminal unit is a receiver unit and compandor. The compandor is also compatible with the one used in the Western Electric "N" system in that it is designed to track with the particular unit. All channel units plug into a rack mounting.

Common equipment is quite limited and employs a 3700-cycle oscillator for signaling functions, a battery filter, a repeater feed unit, and a coupling unit to match channel transmitters and receiver to the cable facilities.

Both channel regulation and repeater regulation are provided and specifications indicate that channel regulation is effected within a range of 20 db with a "stiffness" ratio of approximately 20-to-1, while repeater regulation is effected by sampling a 12-channel composite signal with a range of approximately 15 db and with a "stiffness" ratio of approximately 15-to-1.



At left are three terminals of recently developed Panhandle "LN" carrier. The third system, at the lower left, is a partially equipped terminal. Additional channel terminal units are simply "plugged-in" the rack mounting assembly.

System design permits the use of Western Electric type "N" repeaters or the use of transistorized repeater units supplied by Panhandle. Where the latter-type repeaters are used, a current-regulated inverter, which is a part of the common equipment, will supply up to approximately 180 volts to the repeater string. At each repeater, a method known as frequency frogging is used. In this system design, incoming high-frequency bands are converted to low-frequency bands and the incoming low-frequency bands converted to high-frequency bands. Channel bands within these ranges are also frogged; low channels appear as high channels and vice versa. A large degree of slope equalization is thus obtained without the necessity of inverse slope network.

All channel terminal units plug into a 19-inch relay rack mounting which requires approximately 28 inches of vertical space for a complete 12-channel system. A terminal block located at the lower part of the relay rack mounting permits external connection of various signaling leads and voice extensions.

Test jacks are located externally on the face of the various plug-in units to permit convenient circuit testing. Cut-off-type jacks permit "looking" into the four-wire transmit, four-wire receive and signaling lead extensions.

PROPAGATION COURSE

A SHORT COURSE in radio propagation will be given July 16 through Aug. 3 of this year by National Bureau of Standards.

Administered by the NBS Laboratories, at Boulder, Colo., the course is open to scientific and engineering personnel in industry, universities, and other government agencies.

It was reported that 235 participants, representing almost every state in the Union and several foreign countries, attended the 1961 radio propagation course.

It was further reported that full particulars of the 1962 course concerning curriculum and registration will be provided in the near future.

DATA TRANSMISSION CONTROL

INTERNATIONAL Business Machines Corp. (IBM) has announced the development of a new data transmission control unit that can "tie" large networks of communications facilities and terminals with a centrally located computer.

The programmed transmission control unit Model 7750 permits accessibility in seconds to a large computer.

Inquiries can be received from a system from many locations, be processed, and, in short order, the resulting information can be sent to remotely located terminals. Information being received by the control unit is translated into computer code and fed to the computer at high speeds. Information which has been processed is returned to the data transmission control unit for appropriate routing. The new unit can be used with any one of eight data processing systems furnished by IBM.

A decentralized manufacturing company, for example, could transmit a broad mix of business and scientific data to a computer, through a 7750, states IBM, in many forms, including:

Production data gathered on the factory floor, transmitted via punched card terminals;

Sales information from scores of local offices, transmitted over a telegraph network;

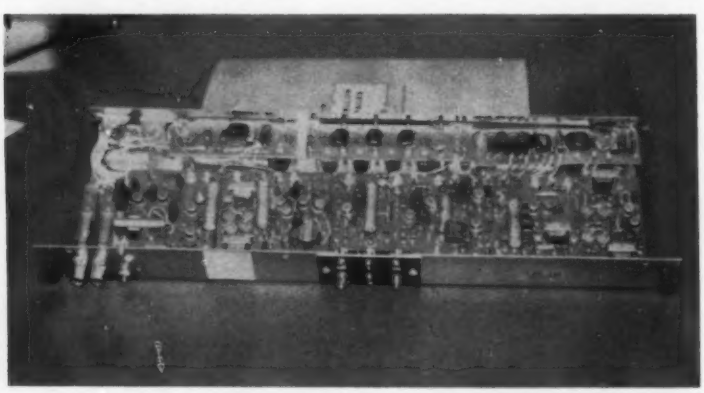
Research data from laboratories, transmitted via magnetic or paper tape terminals;

Inventory statistics from several satellite warehouses, transmitted via punched card or magnetic tape terminals.

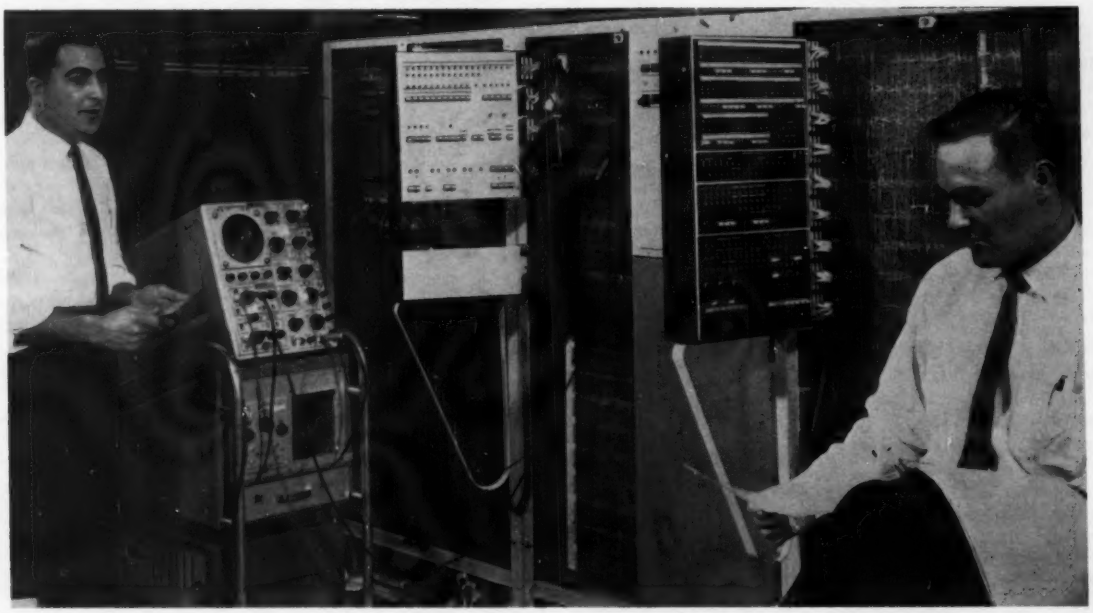
These are only a few of the potential uses of the recently developed data transmission control unit 7750.

"In operation," continues IBM, "the 7750 continually scans its incoming lines for messages. This data is stripped of transmission codes, translated into computer language, and assembled into message form. It is then queried in priority sequence and fed to the computer at high speeds.

"The unit can determine the pri-



A channel terminal of the recently developed Panhandle "LN" carrier system. Conveniently located test jacks on the face of the unit permit terminal and system alignment without external jackfields.



IBM engineers are shown testing solid-state electronic circuitry of the new 7750 programmed transmission control. It is reported by IBM that use of the new data transmission control unit will enable a company more easily to design large Tele-processing systems.

ority of incoming messages and interrupt the computer, if necessary, to permit processing of inquiries requiring immediate action.

"Processed data to be sent from the computer is fed back to the 7750, which translates it into transmission code and sends it over the appropriate communications line to the proper terminal. All these operations are controlled by a program stored in the unit's memory.

SPACE COMMUNICATIONS

IN A LECTURE for the program on space science being broadcast internationally by the Voice of America, Dr. John R. Pierce, Bell Telephone Laboratories, said: "Communications satellites may ultimately serve to link regions of the world which as yet do not even have adequate internal communication."

Dr. Pierce cited speedmail, telephoto, and telephone as possible practical services to be provided by the experimental Echo I satellite.

"If satellite communication depended on the reliable, mature art of electronics alone," Dr. Pierce stated, "we could feel confident of a rapid solution of its problems."

"But its realization is equally dependent," he continued, "on developments in the new, expensive and uncertain art of space. He referred not only to the cost and uncertainty involved in satellite launching, but also to the fact that satellite communication can come into being only through the use of vehicles which have already been developed at great cost primarily for other purposes.

Dr. Pierce observed, "Nevertheless, some first technical steps have been taken which may ultimately help to bring the two very different arts of communication and space together for the service of mankind." To further illustrate this point, he described experiments in communication carried out after the launching of Echo I by the National Aeronautics & Space Administration (NASA) on Aug. 12, 1960.

"Equipment designed for the purpose of tracking Echo I was able to do so with an extraordinary degree of accuracy, in spite of the satellite's rapidly changing orbit," he said. "In a refined form, this same tracking art could be used in a practical communication system utilizing tens of satellites in orbits some thousands of miles high.

"Only about a billionth of a billionth of the 10,000 watts beamed at the Echo satellite is reflected into the receiving antenna," he pointed out, "in spite of which it was possible to provide a high quality telephone circuit."

Dr. Pierce stated, however, that the highly successful Echo experiment can only be regarded as a milestone towards an ultimate goal in the space age. He explained that the Echo I was only a passive reflecting satellite and, he pointed out, if broadband signals such as those required by television are to be transmitted, passive satellites must operate at unsatisfactorily low altitudes.

"There is a general feeling," Dr. Pierce commented, "that the use of active satellites containing radio transmitting and receiving equipment would be most economical in a practical communications system." He pointed out that "an active satellite could easily handle broadband circuits capable of transmitting a television signal or 600 telephone signals."

There are several proposed systems now in various stages of planning and development. Dr. Pierce outlined one of the several proposed systems which would make use of perhaps as many as 50 simple, low altitude satellites orbiting at a height of 7,000 miles.

This number of satellites could provide simultaneously several highly reliable broadband circuits to Europe, and circuits between the United States and Hawaii, Japan and various parts of South America, Dr. Pierce explained.

A so-called "stationary" satellite communications system was also discussed. Satellites in orbit at an altitude of 22,300 miles, and revolving in the plane of the equator in the same direction as the rotation of the Earth, would appear stationary.

This type of communications system could make use of three such equally spaced satellites, one of which would be visible at all times from any point on Earth situated at least 8 degrees from the poles. This system would eliminate the need for complex tracking equipment.

Many problems remain to be solved prior to an operative satellite communications system becoming a reality, Dr. Pierce stressed. Many problems in science remain.

Other than the scientific problems, there remain problems of shared costs, shared use of facilities, and frequency allocations. Many of these problems are international in nature.

TEST EQUIPMENT

EVERY YEAR A greater number of circuit facilities are being derived by electronic methods. In addition, vast quantities of voice frequency repeaters are being installed to improve transmission on existing and proposed wire line facilities. Miscellaneous electronic equipment, such as electronic ringing generators and electronic answering devices, are also being installed. Each of these active devices, by design, creates some real maintenance problems.

As these greater quantities of electronic apparatus are installed, one must design more efficient means of maintenance. New items of test equipment must be obtained in order to reduce outages. Many of these items of test equipment are relatively inexpensive and will, in many instances, more than pay for themselves on one given maintenance application.

Eico new model 955 in-circuit capacitor testor.

Defective capacitors can become a real "dog" to locate. In many instances, considerable time is expended in "breaking" the component out of the circuit for a quick check. Quite often, tests may be performed without such breakage, providing suitable test equipment is available.

An advanced "capacitor testor" recently has been developed by Electronic Instrument Co., Inc. (EICO). The Model 955 includes a Wien bridge with a unique balancing circuit.

The 955 measures .1 mfd to 50 mfd capacities at ±10 per cent accuracy in or out of the circuit. Ranges are selected by an rc range switch. The test frequency is 60 cps. Indications are seen as bar patterns on an electron ray tube.

For short tests, in or out of the circuit with shunt resistance as low as one ohm, a closed bar indication is shown on the electron ray tube. The test frequency is 60 c.p.s., and the maximum test voltage is 6.3 volts (open leads) decreasing, as impedance decreases.

Open tests may be performed on capacitors as small as 15 mmfd, in or out of the circuit. The shunt resistance may be as low as 35 ohms for capacitors of 250 mmfd, or, with capacitors of 15 mmfd, a minimum of 7,000 ohms. The test frequency for opens is approximately 19 megacycles.

Specifications are said to include: Power input 105 to 130 volts, 60 cps, consuming 8 watts; fuse protected; dimensions, 8½ x 5¾ x 6 inches.

The unit may be purchased in kit form or factory wired.

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TE-67

A B C of the Telephone

by Frank E. Lee

KEEPING THE telephone fleet in top condition is the primary objective of an economy maintenance program. This is a worthwhile objective to any fleet operator and is especially valuable to a telephone company. A telephone company cannot afford to delay giving service to a customer because a fleet unit is not in shape to do the job. This applies to fleet passenger cars as well as to trucks and off-highway equipment.

Maintaining the fleet in top condition does not mean additional maintenance expense. On the contrary, the overall operating costs of the fleet are lowest when each unit is in the best operating condition.

PART 102. THE TELEPHONE FLEET. Section 5. Economy Maintenance Program—Good Compression Vital to Engine Performance.

Section 4. Economy Maintenance Program—Checking Fuel-air Mixture (TELEPHONY, Nov. 18, 1961).

Section 3. Diesel Economy May Be Added to the Telephone Fleet (TELEPHONY, Aug. 26, 1961).

Section 2. Good Management Pays Off in Better Fleet Service (TELEPHONY, Apr. 29, 1961).

Section 1. A Vital Link in a Good Communications System (TELEPHONY, Apr. 22, 1961).

Good Engine Compression

An important element in efficient car or truck operation is good engine compression. The charge of fuel and air entering the cylinder from the intake manifold must be compressed to a definite density ratio if an engine is to develop full power and performance. Gasoline is highly volatile even when ignited in the open air. In fact, the ignition takes place with a swoosh-ing sound and at quite a dramatic speed. In a cylinder—with the gasoline-air mixture under pressure—ignition creates a sharp report somewhat like the sound of a rifle cartridge. The explosive force is concentrated. The energy created as the burning charge expands is harnessed in the cylinder chamber to drive the piston down—thus creating the engine's motive power.

Gasoline engine compression ratios are generally on the order of 8½ to 1, 9 to 1, 10 to 1, or some similar ratio in various units of the telephone fleet. Compression ratio, illustrated in *Fig. 1*, is an expression of how much the volume of the gasoline air mixture in the cylinder is reduced on the compression stroke of the piston. For a given engine, a higher ratio such as 10 to 1 generally means more power output than a lower compression ratio, such as 9 to 1, or 8½ to 1.

Other Factors Involved

This comparison is not necessarily valid when two different engines are being compared. Actual horsepower results from other factors such as size of the piston, length of the stroke of the piston, and similar factors, in addition to the compression ratio.

The important point is, if an engine is to develop full horsepower and performance, the fuel-air mixture must be compressed to a specified density ratio. The compression ratio should be the same for each of the cylinders. This is an important requirement if the engine is to deliver maximum power and operate smoothly. The only way

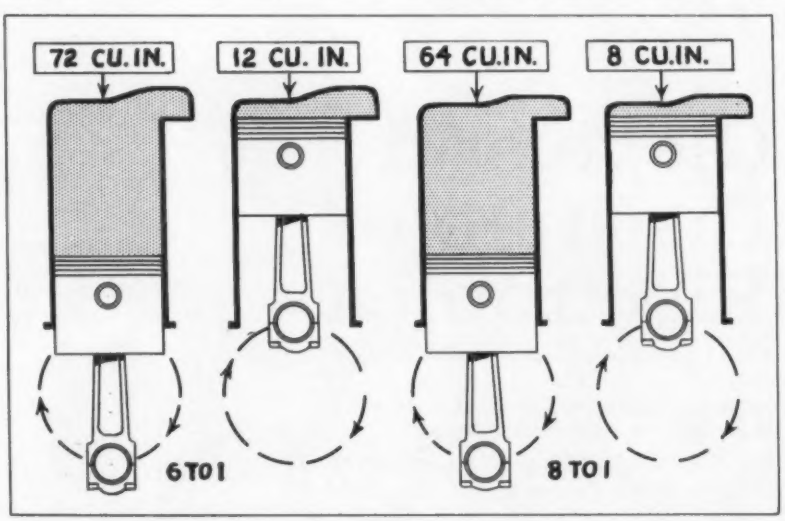

Fig. 1

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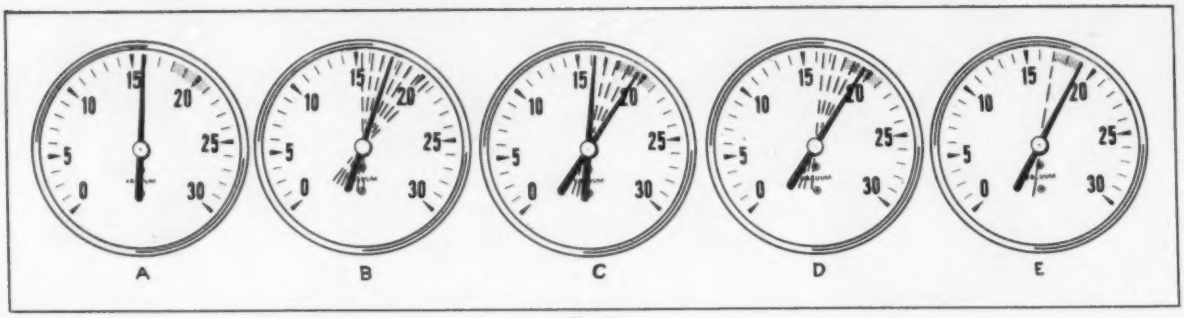

Fig. 2

to be sure that compression is up to factory specifications is to measure engine vacuum and individual cylinder compression with accurate test instruments.

Compression and vacuum tests are relatively easy to make and should be looked upon as important parts of the fleet economy maintenance program. Generally, the results of these tests will indicate the amount of corrective maintenance required to restore the engine to optimum operating efficiency.

Considered Standard Test

The compression test is considered as the standard test for determining the need for valve grinding or piston and piston ring service. This test will also point out cylinders with excessive carbon deposits as well as head gasket leaks. A compression test can be made either with a rigid-type compression tester or with a flexible tubing type of compression tester.

An internal combustion engine is basically a good air compressor. As pointed out in a previous installment of this series, the fuel-air mixture drawn into the cylinder on the intake stroke of a four-cycle engine is compressed on the compression stroke. The highest compression is reached when the piston is in the top dead center position of the stroke.

Atmospheric Pressure

Atmospheric pressure is 14.7 p.s.i. (pounds per square inch). A cylinder of an engine with a 9-1 compression ratio, with a full air-fuel charge, would develop a pressure of about 132 pounds at top dead center. This does not take into account the additional pressure caused by heat build-up of the air being compressed. Neither does this consider any pressure loss caused by leakage past valves and rings. Compression pressure on most vehicles in the telephone fleet generally will fall somewhere between 110 pounds and 165 pounds. The manufacturer publishes specifications showing the compression pressure that should be developed by a particular engine. This information should be used as a guide in analyzing the compression pressure measured in an economy maintenance inspection.

There are a number of conditions that can contribute to a loss of engine compression, including:

(1) Burned or sticky valves.

(2) Weak valve springs.

(3) Excessively worn valve stem guides.

(4) Incorrect valve timing.

(5) Worn piston rings.

(6) Blown, broken, or leaking gaskets.

(7) Loose spark plugs or defective spark plug gaskets.

Replace Old Gaskets

Defective spark plug gaskets generally can be traced to the reuse of an old gasket when a spark plug is removed for cleaning or a service operation. The potential trouble is reason enough why new gaskets should be used when a spark plug is reinstalled in an engine.

Actually, most of the conditions that might cause a loss in engine pressure can be corrected by minor repairs or adjustments. This is another example of potential operating cost reduction resulting from the economy maintenance program.

The best way to be sure engine compression meets the manufacturer's specifications is to check compression and engine vacuum with reliable testing apparatus. The results of these tests generally will indicate the corrective maintenance required to restore the engine to peak operating efficiency.

Compression and intake manifold vacuum usually will be steady and high if the compression is good. A low or variable intake manifold vacuum generally is a good sign there is something wrong with the compression.

Basically, compression and vacuum readings are not measures of directly opposite physical forces, although this is a rather common assumption. The standard or normal atmospheric pressure at sea level is 14.7 pounds per square inch, or 29.92 inches of mercury.

Using normal sea level atmospheric pressure as a starting point, gauge pressures are measurements of pressure greater than—or up from—atmospheric pressure. Vacuum is the difference between atmospheric pressure and some other pressure that is less than atmospheric pressure.

Vacuum could be expressed as a pressure measurement. However, the most common method of expressing vacuum measurements is in inches of mercury. In some instances, the chemical symbol of mercury, Hg, is used to state the amount of a vacuum. Thus, a measurement of 21 Hg is a simplified way of saying 21 inches of mercury.

Gauges Properly Calibrated

Since 14.7 p.s.i. is equivalent to 29.92 Hg, as previously mentioned, then 1 p.s.i. is equivalent to approximately 2 Hg. Zero p.s.i., which is zero Hg, absolutely the zero of pressure beyond which there is no lower pressure. This, then, is the perfect vacuum.

Vacuum gauges commonly used in the fleet shop are calibrated in inches of Hg using a scale from 0 to 30. Zero on the scale is atmospheric pressure and 30 (29.92 inches Hg) is a perfect vacuum.

Interestingly enough, engine vacuum—even on deceleration—never approaches a perfect vacuum. The highest vacuum probably is no higher than 26 Hg.

Relationship Explained

The relationship between compression and intake manifold pressure of a gasoline engine is as follows:

(1) The intake manifold vacuum reading will be steady and high when the compression is good.

(2) A low or variable intake manifold vacuum reading (see *Fig. 2A*) is a sign of poor compression, air leaks, or late ignition timing.

(Continued on page 36)

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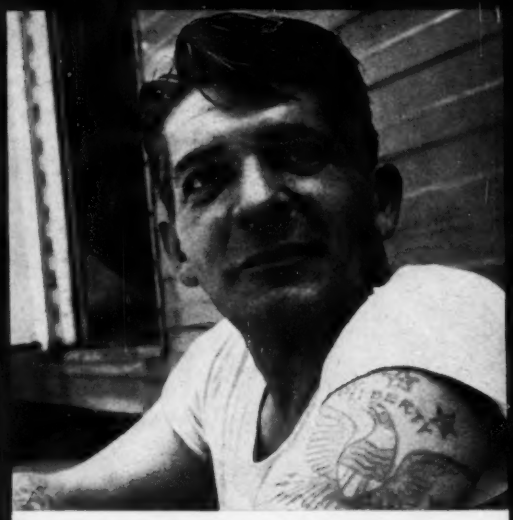

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These facts are quite important to the fleet maintenance program because a simple vacuum test can be made to determine the general condition of engine compression. An over-all vacuum test can be made as follows:

(1) Start and run engine until operating temperature is normal.

(2) Connect a vacuum gauge to the intake manifold. This connection usually is made at the windshield wiper connection at the intake manifold.

(3) Observe and record the vacuum readings at various engine speeds.

Effects of Sea Level

An engine, operating at idle speed at sea level, should build up a steady vacuum reading equivalent to 18 or 21 Hg. This reading will drop the equivalent of 1 Hg for each 1,000 feet elevation above sea level. A comparison of vacuum and pressure readings for various altitudes above sea level is made in *Table 1*.

Some of the more common engine trouble conditions which may be detected by the over-all vacuum test are as follows:

(1) **Weak Valve Springs.** (Usually are not troublesome at idle speeds.) Vacuum gauge reading is steady between 18 and 21 on scale. Needle tends to flutter excessively as engine speed is increased, as illustrated in *Fig. 2B*.

The engine design is a good way of determining whether weak valve springs should be replaced as a separate job. Valve springs on overhead valve engines are readily accessible by removing the valve cover. This makes valve spring replacement a relatively short time job. Access to the valve springs on an L-head engine requires the removal of valve cover plates which may be inaccessible unless major engine rebuilding is in progress.

Weak valve springs often are accompanied by other valve troubles which can only be corrected by a complete valve job. Then accepted maintenance practice is to replace the complete set of valve springs because one or two weak springs is a pretty good sign that all will soon be in need of replacement.

Replacing Valve Stem Guides

(2) **Worn Intake Valve Stem Guides.** Will cause the vacuum gauge needle to vibrate rapidly at idle engine speed, as shown in *Fig. 2C*. The vibration disappears as engine speed is increased.

The replacement of worn valve stem guides is comparable to an ordinary valve job from a cost and labor standpoint. Usually the valves will be found in need of a complete reconditioning once the head is removed.

Comparison of Vacuum and Pressure Readings at Various Altitudes

Altitude Above Sea Level (feet)	Vacuum Gauge Reading	Atmospheric Pressure
Sea level	19.5	14.7
1,000	18.5	14.1
2,000	17.5	13.6
3,000	16.5	13.1
4,000	15.5	12.5
5,000	14.5	12.3
6,000	13.5	11.6
7,000	12.5	11.2
8,000	11.5	10.8
9,000	10.5	10.4
10,000	9.5	10.0

TABLE I

(3) **Gummy Valve Stems.** (Cause valves to stick.) Vacuum gauge needle shows intermittent drop in engine vacuum whenever a sticking valve operates. The three or four point intermittent drop of the vacuum gauge needle caused by sticky valves is illustrated in *Fig. 2D*.

An approved solvent for removing the gummy residue causing the valves to stick can be fed into the intake manifold through the carburetor or can be added directly to the fuel or crankcase lubricating oil. The use of these gum-removing solvents is recommended as a regular economy maintenance procedure.

Tends to Hold Valve Open

Gummy or sticky valve stems tend to hold a valve open. There is a danger of the combustion flame burning the valve face and seat. Valve damage may also occur because the heat from the valve is not carried away. Valves in modern high compression engines need all the time they can get to cool by completely contacting their seats during each operating cycle.

(4) **Rich Fuel-Air Mixture.** A floating motion of the vacuum gauge needle, back and forth, as shown in *Fig. 2E*, is an indication of rich fuel-air mixture. A simple carburetor adjustment, in this instance, should result in an improvement in the economy performance of this fleet unit.

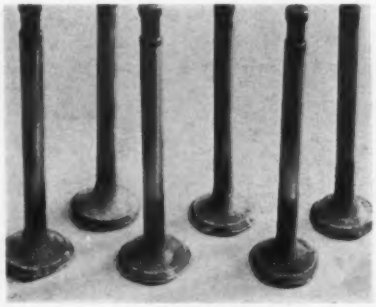


Fig. 3

(5) **Burnt Valves.** (Will not seat properly.) Compression will be lost and there will be a constant drop in the vacuum gauge reading. Examples of burnt exhaust valves which cause cylinder and combustion chamber leakage to materially lower compression pressure are shown in *Fig. 3*. Burnt valves indicate the engine is in need of a complete valve job. Replacement of the valves, in accordance with accepted maintenance procedures, is recommended.

Timing System Repairs

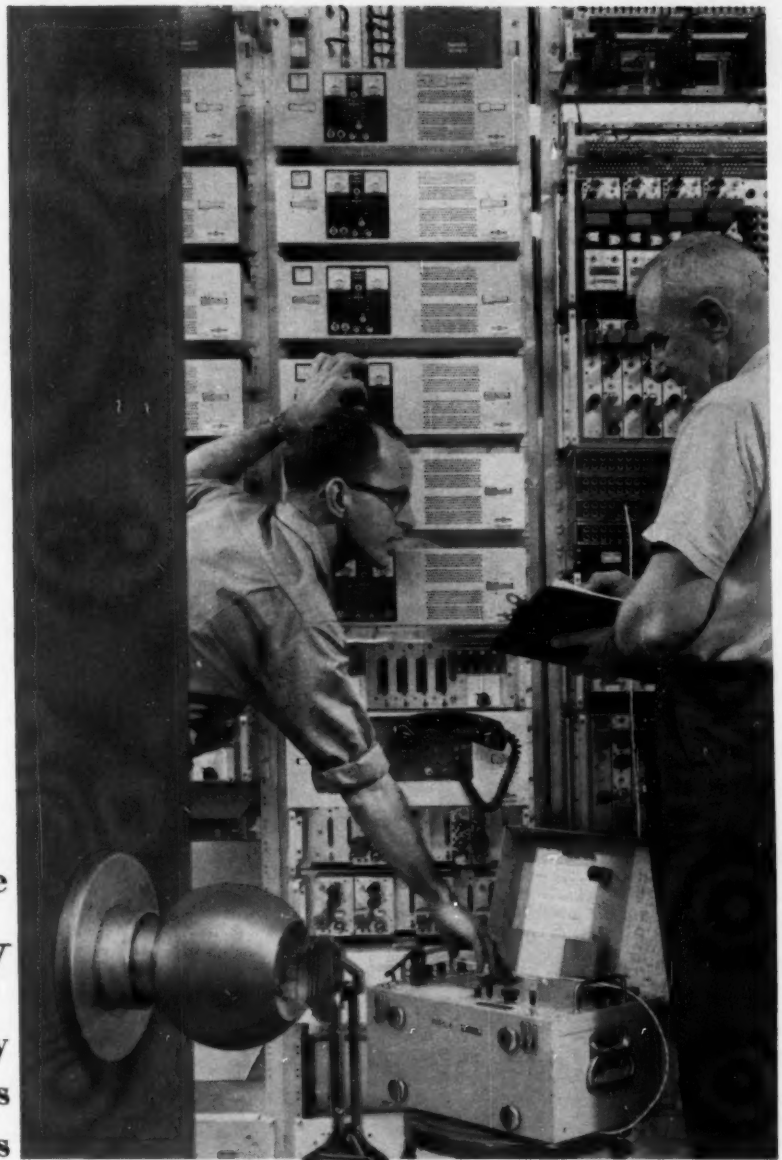
(6) **Delayed Valve Timing.** (Indicated if the vacuum gauge needle shows a steady reading between 10 and 15 on the scale.)

Delayed valve timing usually is traceable to worn gears, sprockets or chain in the timing system. As a rule, timing system repairs involve a considerable amount of tear-down and reassembly time. Although the repairs must be made to restore engine operating efficiency, this is an example of a more extensive maintenance operation which does not fall within the fleet economy maintenance program. Instead, this and other more extensive repairs should be included in the major overhaul program.

The function of the economy maintenance program should include only the minor adjustments needed between major overhaul periods.

(7) **Leaky Intake or Carburetor Gasket.** (Usually results in a vacuum gauge needle reading below 5.)

The defective gaskets should be replaced to improve engine performance and to permit more conclusive overall engine vacuum tests.



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(8) **Leaky Head Gasket Between Cylinders.** (A suspected trouble condition when the vacuum gauge needle fluctuates between 5 and 19 on the scale.)

The head gasket should be replaced if the trouble analysis is supported by an individual cylinder compression test.

(9) **Cylinder Compression Tests.** The engine vacuum test, as previously mentioned, provides information to help determine whether or not individual cylinder compression tests should be made. There is little to be gained from individual cylinder tests if the vacuum gauge needle remains steady at about 20 on the scale. This is so because good compression is necessary to maintain a good vacuum. A poor vacuum reading, however, is a sign that a more specific individual cylinder compression test would be worth-while.

A good point to keep in mind with regard to engine compression is that uniform compression in all cylinders is of relatively more importance than extremely high compression readings. Most engines in today's fleet passenger vehicles have compression ratios ranging between 8 to 1 and 10 to 1. One of the new 1962 engines has a compression ratio of 11 to 1. This, however, is an exception to the average, which is around 9 to 1.

Cylinder Compression Tests

Engine compression ratios on the order of 8 to 1 to 10 to 1 have been in use in fleet passenger vehicles and light trucks for a number of years. Compression ratio, however, is more of an engine design specification than an engine maintenance specification. Thus, the compression pressure developed by each cylinder becomes a measure of the performance that can be expected of a given engine at a given time. A method of making individual cylinder compression tests is as follows:

(1) Start the engine and run until the operating temperature is normal. This assures that all parts will be in standard operating shape, free of any distortion that may take place when the parts are cool. The various engine parts will also be properly lubricated as required for these test procedures.

(2) Remove all the spark plugs. This eliminates the compression load on the starter that otherwise would be added by the cylinders not being tested at a given time. Examine each spark plug for cracks or defects that possibly would cause a compression leak.

(3) Place the adapter fitting of a cylinder compression gauge into the spark plug hole of one of the cylinders.

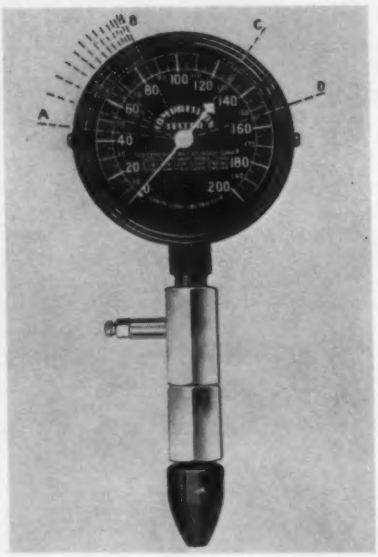

Fig. 4

(4) Leave the ignition off. Open the throttle and crank the engine with the starter.

(5) Turn the engine a few times. Count about six or seven "beats" of the starting motor and use the same count for each cylinder. Observe and record the highest compression reading registered on the gauge.

Rise of Needle Indicative

The compression of an engine cylinder in good condition is indicated by a steady rise of the compression tester needle from A to B, as illustrated in *Fig. 4*. Each rise of the needle will be progressively less for each revolution of the cranking motor. Cylinders with very high compression pressures may peak at C or even D.

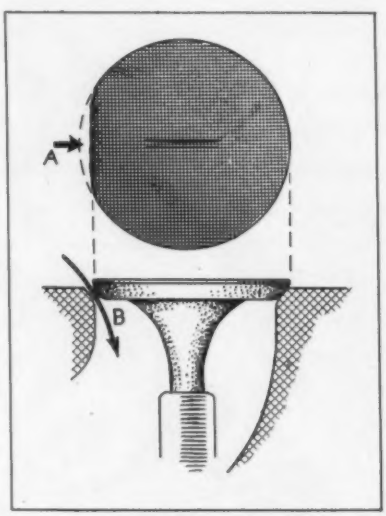

Fig. 5

(6) Make similar compression tests of the remaining cylinders. Record the results.

(7) Compare the pressure readings. All cylinders should read alike, within a range of five to 10 pounds for good engine performance. Actually, the uniformity of compression in all the cylinders is of relatively more importance than compression readings as specified by the manufacturers. This should not be taken to mean that a high compression reading in a high compression engine is not important.

Uniformly high compression would normally be expected in a high compression engine. Readings somewhat lower than the manufacturer's specifications probably would have no bearing on the engine's performance if the readings were uniform. As stated above, more serious engine trouble usually is indicated when the compression readings are not uniform.

Analyzing Readings

Three typical illustrations can be used to describe the engine trouble indicated by noticeable variations in individual cylinder compression readings:

(1) **One cylinder has low compression reading.** This condition is usually caused by burnt or gummy valves or a similar poor valve condition. Piston blow-by is also a possibility. A burnt valve, such as illustrated in *Fig. 5*, always shows up on an individual cylinder compression or leakage test. The metal burned away at A, allows leakage at B, when the valve is seated.

A suggested maintenance procedure is to remove the cylinder head, examine the valves, check the piston-cylinder wall clearance with a feeler gauge, and then take the proper steps to eliminate the trouble condition.

Introducing oil into the cylinder area is not recommended as a way of determining which of the two conditions is causing the low compression reading. Oil tends to increase the compression ratio in the cylinder under any condition. The result could possibly be an incorrect trouble analysis.

(2) **Low compression reading in adjacent cylinders.** This generally results from a blown head gasket between the two cylinders. Replacement of the head gasket generally will clear up the trouble.

(3) **Random cylinders have irregular compression build-up.** This is a sign of gummy valves or possibly gummy piston rings. Use of an upper cylinder lubricant is recommended. The upper cylinder lubricant will work in all the cylinders at the same time. The lubricant will help restore a uniform com-

(Continued on page 52)

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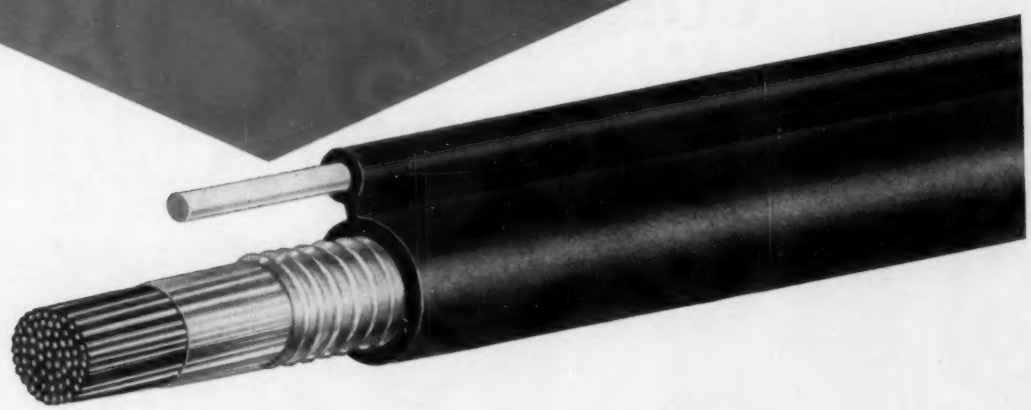

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Generally, ¼" diameter 7-wire strand (6650# breaking strength) is used as a messenger for Types I.M. Tel-U and I.M. Tel-CU cable. The concept of a *graded* messenger provides for the use of .109" solid galvanized steel (1800# breaking strength) or .134" solid galvanized steel (2680# breaking strength) support member for the smaller cables, as controlled by field conditions outlined.

* Up to 18 pair 19AWG, 25 pair 22AWG, 50 pair 24AWG.

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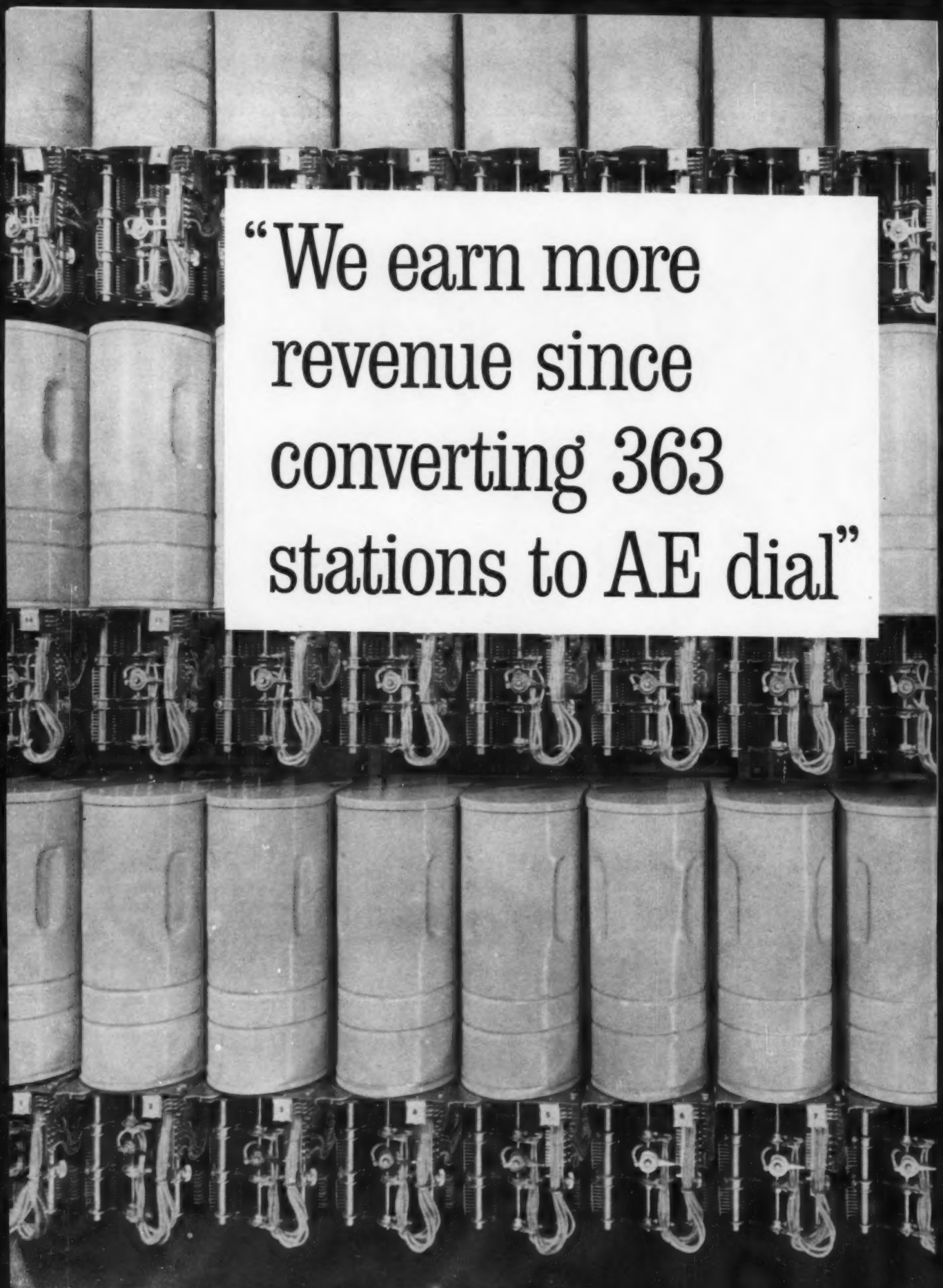
"We earn more
revenue since
converting 363
stations to AE dial"

reports Chester Speck

MANAGER, CENTRAL TELEPHONE COMPANY

LIKE father, like son. That maxim underlines the history of Central Telephone Company in Vici, Oklahoma. Back in 1907, E. A. Speck introduced this community to the telephone. A half-century later, in 1960, Central Telephone Company brought modern dial service to Vici. The man responsible: Chester Speck, son of the founder.

Vici's conversion to dial was conditioned by population growth. In the process of becoming a thriving community, Vici's business and residential needs outgrew its telephone service. Chester Speck had this to say about the problem: "The features that customers want in telephone service are uniform speed, accuracy and convenience. We could no longer offer these features with manual equipment. Then, too. lack of reliable operators aggravated the problem. And our profit was cut by higher operating costs."

Another concern was the rural area of Vici. Central operates in the city limits, but services a 15 mile radius, which includes the rural area. This area is operated by farmers, who built their own lines and were paying Central a service charge per station per month. However, transmission was poor since each line averaged 20 persons. Should the farmers decide to take dial service from a nearby exchange—and this was a possibility—Central would lose revenue.

Obtaining new parts was impossible so Central was forced to jerry-build. This was unsatisfactory to Chester Speck: "The telephone business is a service business. You can't give proper service when you operate with makeshift equipment." What was the answer? "No question, the solution was dial," replied Mr. Speck.

The problems faced by Central were typical of those faced by small telephone companies. No one knew this better than Carl Wiley, AE representative. He understood Central's difficulties and the Vici area from firsthand observation. Further, Carl's long experience and practical training in telephony made him well qualified to guide Central on dial conversion. No one knew this better than Chester Speck. He had benefited from Carl Wiley's seasoned judgment in the past.

On balance, the facts favored AE dial equipment. And one fact above all others impressed Chester Speck. "With AE dial equipment," says Mr. Speck, "there's no limit to expansion. Each switch, each shelf, each frame is a unit—made so you can easily add more later. You save money and keep your net earnings up."

After selling the farmers on Central's conversion, Chester Speck took up the matter of financing. Together with Carl Wiley and George Summerscales, AE district manager, a $35,000 loan was worked out.

To house his new dial equipment, Chester Speck bought a nearby building. Carl Wiley gave advice on remodeling: "The forecasting of building space has top priority. You must consider community growth for at least 10 years, not to mention new technical developments. And when installing equipment in an existing building, you must be certain that any reduction of aisle space won't hinder maintenance work." Carl concluded: "Proper dust control and air moisture content, as well as lighting and external appearance, are all important considerations."

Elsewhere, there was other activity. Outside plant in the rural area was rebuilt—partially rebuilt within the city limits. A new fire-reporting system was put into operation. Carl Wiley sold three Type 87 multi-line phones to Central's biggest customer, the local bank. AE technicians helped assign new numbers, planned a faster billing system. Observed Chester Speck: "AE helped us all the way in every way."

On July 15, 1960, Central Telephone Company converted to AE dial. Today, it serves 363 stations—service is great, revenue is up. The rural area has only 10 persons per line and transmission is 100% improved. Standing outside the exchange building, Chester Speck commented on the conversion: "With our manual exchange, we weren't ready for the future. Now that we have AE dial service, it's up to the future to keep up."

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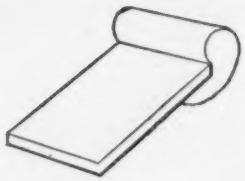
GENERAL SYSTEM

The Plant Man's NOTEBOOK



By RAY BLAIN, Technical Editorial Director

THE GENERAL TELEPHONE Co. of Kentucky recently installed an ultramodern communication system in the newly refurnished and enlarged Campbell House in Lexington. Some of the modernistic features of this hotel's private automatic branch exchange system include customer initiated calling, internally and externally, for local and long-distance calls; automatic metering of local calls; and convenient message waiting service for hotel guests. The system presently serves 168 telephones and has an immediate capability of 200.

This communication system formerly required two operators. However, one operator can now handle the telephone traffic with the assistance of the many automatic features provided. Guests are furnished a special directory which is attached to each room telephone. This directory conveniently instructs each guest as to how he can dial hotel personnel, hotel, services, and major locations within the hotel, via one or three digits, without the assistance of the hotel operator.

Each guest also has direct access to Lexington telephones and long-distance operators by dialing predetermined numbers from his telephone. Another new feature is the inter-room dialing between guests without the assistance of the hotel operator. Guests' local calls are automatically metered and recorded by a "message metering service" to provide rapid and accurate billing of all guests.

"Message waiting service" is another plus in the modern communications of this large hotel. It consists of an operator-activated lamp, located on all room telephones, to inform the room occupant that a "message is waiting".

"Automatic diverting" equipment directs calls to the hotel operator, when they are not placed properly, or when difficulty is experienced in placing them. The switchboard operator will then give assistance in completing such calls or offer services desired.

PBX automation is proving advantageous to both the customer and the operating telephone company. It provides better service at a reduced cost to the customer, and increases the revenues of the telephone company. Communications consultants of all telephone companies can perform a great service in making their PBX customers familiar with this modern service.

•

Out in San Diego, Cal., they have developed a system of pulling television cameras through sewer lines, which provides an inexpensive method of locating seepage areas. The location of required repairs, utilizing this method, eliminates the necessity for digging up entire sections of pipe.

•

A major analysis of Soviet education recently published by the National Science Foundation indicates that the Soviet Union is producing two to three times as many scientific and technical professional graduates annually as the United States. Moreover, Soviet production of science and engineering professionals is seen as accelerating throughout the 1960's reflecting the total Soviet commitment to developing science and technology as economic and political weapons of the state.

The extent of the orientation of Soviet higher education toward science and technology is measured by the fact that about 57 per cent of all 1959 graduates, at the bachelor degree level, were in engineering, science and selected science fields, as compared with 24 per cent in the United States.

•

Public relations vice president for Northwestern Bell, Glenn Allen, in his report on a telephone man's trip behind the iron curtain, when asked "Did the Russians want to know about our telephone setup?" replied:

"They are familiar with the technical aspects of our equipment. Apparently, they are able to get our telephone journals translated. They did ask about wages and working conditions over here. I showed them the current company-union contract and they were amazed at the wages and working conditions of the United States telephone worker. They pay employes about $85 a month. They do, however, pay more to those who do the best work."

•

The Southern New England Telephone Co., New Haven, Conn., awards white headsets to operators who are winners in the competition with other girls in their units for the title of "Miss Voice and Courtesy". Proud wearers of these snowy white headsets typify the outstanding service which is the goal of traffic's "Voice and Courtesy" program. By spring, there will be 33 girls, one from each of the company's traffic units, wearing the white headsets. Every year, a new winner will emerge from each of the 33 units.

The winner of a white headset keeps it for life. If she ever leaves the company, she takes the "trophy" home with her.

Winners are judged by means of tape recordings. Tapes are made of each candidate's performance while handling calls, and sent to a different toll center for judging by the local "Voice and Courtesy" committee.

•

Some of the large operating telephone companies are adopting yellow and black diagonal markings for the back of their work vehicles. It is believed that this reflective barricade-type striping will provide the following safety advantages:

Make it easier for other drivers to see telephone company vehicles.

Make it more obvious that a telephone company vehicle is parked beside the road prior to the placement of warning flags.

Help prevent other vehicles from following too closely.

"Cross Talk"

To do business without advertising is likened to winking at a girl in the dark. You may know what you are doing, but nobody else does.

•

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Courts and Commissions

OK Neb. Rate Increase, But Deny Permit to Issue Notes

The Nebraska Railway Commission on Feb. 14 approved rate increases for the K. & M. Telephone Co., Chambers, but denied authority to issue notes and mortgage in an amount not to exceed $20,000.

On June 28, 1961, the company purchased the Chambers Independent Telephone Co., including the Amelia exchange (TELEPHONY, July 22). K. & M. is now in the process of eliminating the Amelia exchange which will be served from the Chambers exchange when this is converted to dial service.

Since 1955 when present rates were established, the company has had a net increase in investment of $40,000. It has borrowed $6,000 and finds it necessary to borrow $10,000 more from the Chambers State Bank. Notes are, and will be, secured by a mortgage for a period of not to exceed 12 months from the date of execution.

The company asked permission to convert these short-term notes and the mortgage into evidence of indebtedness payable at periods of more than 12 months. This was denied without prejudice "for the lack of sufficient evidence".

Net rates were approved as follows:

	Old	*New*
One-party business	$5.00	$8.00
Two-party business	4.00	7.00
Rural business	....	5.00
One-party residence	3.25	5.00
Two-party residence	2.85	4.50
Four-party residence	2.30	4.00
Rural business	..	5.00

Based on present development and additional subscribers to be served in the Amelia area, the proposed rates would produce an annual operating revenue of $24,043.47. Annual expenses are estimated at $19,422.52, leaving an amount of $4,620.95 for interest and dividends. This would produce a rate of return of 6.51 per cent on a projected net book rate base of $70,536.30, or a rate of return of 6.06 per cent on a current value rate base of $76,200.

OK N.Y. Merger, Approve Reinstatement of Tolls

The New York Public Service Commission on Feb. 16 gave its final approval to the merger of Cazenovia Telephone Corp. into Midstate Telephone Co., Manlius (TELEPHONY, Dec. 23).

In December, the commission authorized Midstate to acquire the stock of Cazenovia by issuing up to 3,125 shares of its common stock and ex-

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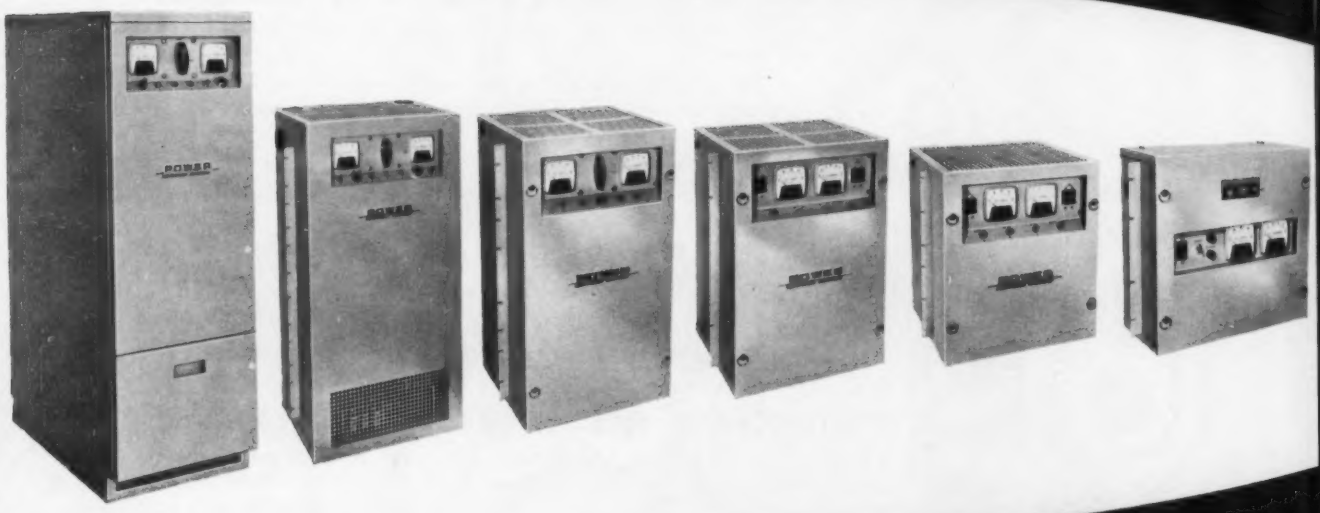

changing them on a five-for-one basis for the 625 outstanding shares of Cazenovia stock. The company was also allowed to issue an additional 1,250 shares of its 5 per cent $100 par value preferred stock, to be exchanged on a share-for-share basis for similar stock of Cazenovia or, in the alternate, to be sold at par with the proceeds to be used to purchase the Cazenovia preferred stock.

At that time, Midstate was told it could apply to the commission to merge the two companies after it had acquired at least 95 per cent of the outstanding Cazenovia stock.

Midstate has since notified the commission of its acquisition of all outstanding shares of Cazenovia stock and applied for approval of its certificate of merger which was adopted by its board of directors on Dec. 30, 1961.

Midstate serves about 5,100 subscribers through dial offices at Brewerton, Central Square, Manlius, Munnsville and West Winfield. The Cazenovia company serves about 1,700 subscribers in and near Cazenovia.

•

The commission on Feb. 17 ruled that Chenango & Unadilla Telephone Corp., Norwich, and Western Counties Telephone Corp., New York City, need not continue toll-free service between their respective subscribers at Lisle and Center Lisle, (TELEPHONY, June 10).

Residents of the Lisle Area receive telephone service through the Whitney Point exchange of Chenango & Unadilla. Those in the Center Lisle area are served through the Marathon exchange of Western Counties. Before the conversion of the two exchanges to dial service, toll-free service had been afforded between Lisle and Center Lisle, but was not applicable to the balance of subscribers of the Whitney Point and Marathon exchanges.

Also on Feb. 17 the commission authorized Chenango & Unadilla Telephone to increase rates to the 800 subscribers of its Whitney Point exchange.

The current rulings result from proceedings initiated by the commission when subscribers of the two companies at Lisle and Center Lisle protested proposals to discontinue toll-free service between the two communities.

After these protests had been received concerning the toll-free service, which was applicable to about 130 subscribers in Lisle and to about 120 in Center Lisle, the service was continued pending the outcome of an investigation.

At the same time, the commission suspended the tariff proposal by Chenango & Unadilla under which its Group II dial service rates, 50 cents higher than manual service rates, would have become effective within the Whitney Point exchange, also pending the outcome of the investigation.

At subsequent public hearings, it was testified that C&U had canvassed its Lisle subscribers both prior to the conversion to dial service and subsequent to the institution of the proceeding to determine whether they desired to have intercompany toll-free service continued but at slightly higher rates.

The cost of installing necessary equipment to make such an arrangement possible reportedly would have resulted in an additional charge of $1.25 monthly to each C&U subscriber while Western Counties said it would have had to raise its rates by 65 cents monthly.

The results of such canvasses, it was stated, showed a majority of the subscribers to be opposed to the extended area service at the higher rates it would entail. It was also testified that over a four-month period intercompany calls between Lisle and Center

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Lisle averaged no more than 2.4 per subscriber per month. The toll charge for a four-minute call is 15 cents.

In a report to the commission, examiner Russell E. Dunn said . . . "In view of the fact that the usage of this privilege is relatively low, there appears to be no reason why all subscribers in these communities should be subjected to the payment of an additional charge each month to enable a relatively few to enjoy toll-free service."

After disposing of the case involving toll-free service between Lisle and Center Lisle, the commission vacated its suspension of the 50-cent increase proposed for subscribers of C&U's Whitney Point exchange, thereby enabling the company to raise its charges there to the same level as for its other exchanges of comparable size. This will give the company an additional $4,800 in annual revenue.

Ask Note, Sale OK; Approve Loan, Tolls, Raise in Ind.

The Indiana Public Service Commission has before it the following petitions:

Craigville Telephone Co. Inc. has asked to borrow $75,000, issue mortgage notes, and increase rates and charges on conversion to dial.

•

Deer Creek Cooperative Telephone Co. and Burrows Telephone Co. Inc. are seeking approval for the sale of their property to Camden Telephone Co. Inc. The Camden company is requesting permission to convert the acquired exchanges to dial and to establish dial rates on conversion.

•

The commission has taken the following actions:

General Telephone Co. of Indiana, Inc. was given permission to borrow 10 million dollars from the Bankers Trust Co.

•

The General company was also allowed to eliminate existing optional extended area service between its Connersville exchange and the Falmouth exchange of the Falmouth Telephone Co. and to replace this service with toll at standard toll rates.

•

Smithville Telephone Co., Elletsville, was ordered to stop rendering service within the Kempton exchange area, which is certified to the Central Indiana Telephone Co., Inc., Brookston.

The Smithville company was permitted to continue serving only those Kempton subscribers whom it was serving at the time the boundaries of the Kempton exchange were set in 1954, and the certificate of territorial authority issued.

The Central Indiana company acquired the Kempton exchange on Oct. 7, 1960.

•

The Uniondale Telephone Co. Inc. was granted a rate raise (TELEPHONY, Oct. 14, 1961).

The Uniondale company stated that as a result of increased expenses, incurred mainly because of the amendment to the Federal Wage and Hour Law, the company would have suffered a $699.12 loss in 1962 under its old rates.

New rates will give it a net annual operating income of $7,706. These approved rates are as follows:

Magneto	
Business:	
One-party	$5.50
Two-party	4.50
Residence:	
One-party	4.00
Two-party	3.50
Four-party	3.25
Rural	3.00
Common Battery	
Business:	
One-party	6.00
Two-party	5.25
Residence:	
One-party	5.00
Two-party	4.00
Four-party	3.75
Rural	3.50

Two Ask Authority to Sell to Oklahoma Corporation

The Oklahoma Corporation Commission on Jan. 25 received the applications of the Council Hill Telephone Co., and of the Hitchita Telephone Co. for permission to sell to Oklahoma Telephone & Telegraph, Inc., Dustin. Thelma Mankin and Hazel Jones are the respective owners of the companies wishing to sell.

Don Wade, owner and operator of the Hanna Telephone Co. and of the Dustin Telephone exchange, purchased in recent years, has formed a corporation entitled Oklahoma Telephone & Telegraph Inc., and maintains business offices at P. O. Box 1375, Dustin. Since Mr. Wade's ownership, the Hanna exchange has been cut over, and Hitchita and Dustin are reported soon to do so. Council Hill is said to be planning conversion at a later date.

Report Kentucky Sale

The Jenkins, Ky. exchange of the Universal Telephone & Telegraph Co. has been sold to the Blue Grass State Telephone Co., Davis, W. Va., which was recently incorporated as a subsidiary of Continental Telephone Co., St. Louis.

AT&T Accepts Purchase Bid For $300 Million Debentures

American Telephone & Telegraph Co. on Feb. 14 accepted a bid of 101.07 for the purchase of 300 million dollars principal amount of 32-year 4⅝ per cent debentures due Feb. 1, 1994.

The interest cost to the company will be approximately 4.5611 per cent.

Halsey, Stuart and Co., Inc. and First Boston Corp. represented the successful bidders. They plan to offer the issue to the public at 101.767 to yield approximately 4.52 per cent to maturity.

The debentures will not be redeemable before Feb. 1, 1967.

Purchasers of the debentures will have the option of making payment for them either on or about Mar. 5, or on or about Apr. 10.

The last debt issue offered by AT&T was on June 6, 1961, when a 250-million-dollar issue was sold at an interest cost to the company of 4.73 per cent.

Proceeds of the new issue will be used for general improvement and expansion of Bell System services, the company stated.

Michigan Independent Granted Territory and Stock OK

The Upper Peninsula Telephone Co., Wallace, it was reported on Feb. 1, received authority from the Michigan Public Service Commission to offer dial service at Felch, Ralph Foster City, Hardwood, and LaBranch, and some rural areas, the first time exchange service has been available in this area.

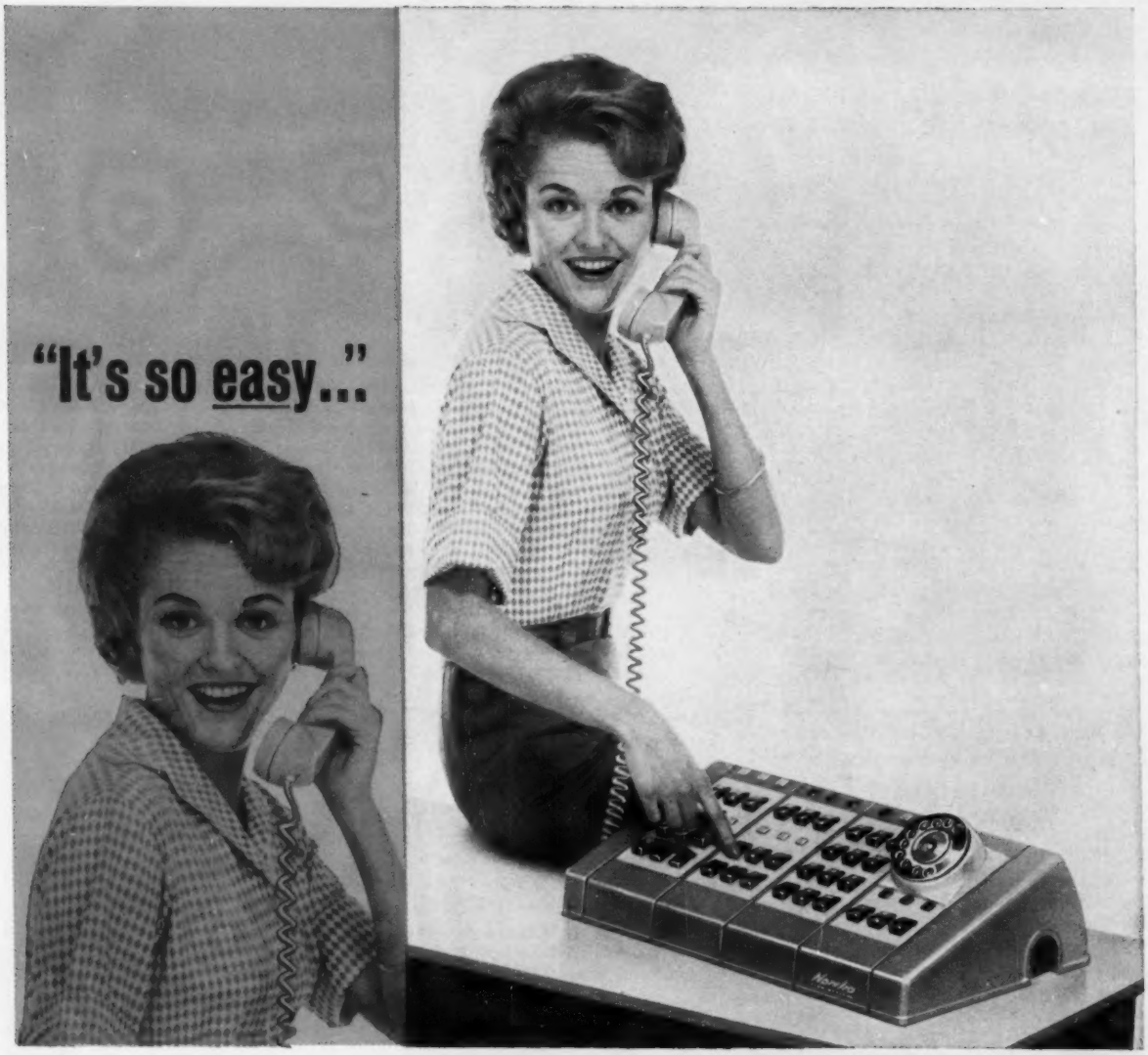
The commission also authorized the Upper Peninsula company to issue $50,000 of 5 per cent preferred stock, and to increase its capitalization from $100,000 to $200,000. Proceeds from the sale of these securities are to be used for plant improvement at the company's Carney, Felch, Marenisco, and Wallace exchanges.

General Telephone Subsidiary Asks $180,000 N. Y. Raise

The New York Public Service Commission on Feb. 15 blocked a proposal of Tri-State Associated Telephone Corp., Johnstown, to increase its rates by about $180,000 annually, pending the outcome of an investigation into the company's financial requirements.

The company had proposed to put the new rates into effect on Feb. 16. A public hearing to consider them will be held at a date and place to be announced later, the commission said.

Tri-State serves about 5,675 stations through dial offices at Port Jervis and Barryville. It is a subsidiary of Gen-



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eral Telephone Co. of Upstate New York, Inc.

Two-for-One Stock Split Is Voted by CW&T Shareholders

Shareholders of California Water & Telephone Co. approved a two-for-one split of the common stock at a special meeting held on Feb. 14. They also authorized an increase in both the common and preferred capitalization.

An application has been submitted to the California Public Utilities Commission seeking authority for the issuance of the new common shares. Subject to the commission's approval, it is contemplated that the split will be made effective early in March, at which time each of the holders of the common stock will receive one new share of the $6.25 par value common stock for, and in addition to, each share held.

On the basis of the present quarterly dividend of 36 cents per share, it is the intention of the company to pay a quarterly dividend of 18 cents per share after the stock split.

OK Sale of 2 S. C. Companies; Approve Loans by Purchasers

The South Carolina Public Service Commission has approved the sale of the Commercial Telephone System, McClellanville, to the McClellanville Telephone Co. and of the Home Telephone Co. of Norway to the Norway Telephone Co. Inc.

Also authorized was the borrowing of about $200,000 by both purchasers from General Dynamics/Telecommunication for making improvements and for the purchase of new equipment.

Petition for the sale of the Commercial system was submitted by Nancy S. Bigbee: petition to sell the Home company by James C. Williams.

GT&E Reports '61 Net Sales, Revenues of $1,227,000,000

General Telephone & Electronics Corp. had record sales and revenues for 1961, according to an announcement issued on Feb. 13 by General's chairman and chief executive officer, Donald C. Power. Net sales and revenues amounted to $1,227,000,000 for 1961 compared with $1,179,000,000 for 1960.

Net income was $73,774,000 for 1961 compared with $72,430,000 reported at the end of 1960. During 1961, the remaining outside interest in Associated Telephone & Telegraph Co. was acquired by General, and thus the year's earnings reflect the net income applicable to the minority interest. The equivalent 1960 minority earnings were not included in the year-end figure of $72,430,000. Had Associated been wholly owned in 1960, net income for that year would have been $75,433,000.

This group viewed the first Michigan telecast of the United States Independent Telephone Association's film "The Independent", during a luncheon meeting of the Michigan Independent Telephone Association (MITA) in Lansing, recently. Standing (left to right) are: Charles Harris, president of Harris-McBurney Co.; Robert Poll, public relations executive of the Michigan Bell Telephone Co.; Glenn Watterson, vice president of the Southern Telephone Co., Brooklyn; George Loomis, the MITA counsel; Steve Nesbit, president of Michigan's constitutional convention; L. V. Hufford, chief of the telephone section of the Michigan Public Service Commission; and John Jefferies of Michigan State University, coordinator of the USITA Engineering Conference. Seated (left to right): Robert Squires, president of Michigan Directory Advertising Co.; Mrs. Charles McLellan, and Charles McLellan, executive vice president of MITA; and Mesdames Squires, Poll, Hufford, Nesbit, Jefferies and Loomis.

Earnings per share for 1961, after preferred dividends, were $1.00 on 73,287,000 average shares outstanding, compared with $1.04 for 1960 on 71,-698,000 average shares outstanding.

In commenting upon the results of 1961, Mr. Power pointed out that net income from telephone operations had reached a new high of 50 million dollars compared with 43 million dollars in 1960. Manufacturing net income was lower than the previous year, but fourth quarter results of 1961 had shown a definite upward trend, particularly in the electronics side of the business and in some of the more highly volatile consumer items. Mr. Power indicated that the business recession which occurred in the early part of 1961 had affected these items rather severely but real improvement had been shown toward the close of the year. Mr. Power also indicated that he was optimistic that this trend would continue through 1962.

In January of this year, General reached another milestone when it installed its 5-millionth telephone. Total gain in number of telephones amounted to 327,000 during 1961. Mr. Power pointed out that the company had invested more than 256 million dollars in the expansion of its telephone facilities and manufacturing plants during 1961, and with the continuing demand for all types of communications services, it was apparent that this trend would continue for the next several years. During the past five years General has invested more than one billion dollars in its plant and equipment facilities.

United Utilities Reports New Earnings High in '61

Gross revenues, net income, and earnings per common share reached new highs in 1961 for United Utilities, Inc., according to C. A. Scupin, president.

Gross operating revenues for the 12 months of 1961 were $50,491,200, an increase of $3,334,300 over 1960. The increase was achieved despite the fact that United's propane interests, which contributed nearly a million dollars to system revenues in 1960, were sold last June. Nearly 90 per cent of the United System's revenues now are derived from telephone operations.

The balance of income for common dividends for 1961 was $7,047,300, an increase of 14½ per cent over the $6,-154,100 recorded in the previous year.

Earnings per average share of common stock for the year were $1.37, a gain of 16 cents over 1960 when a lesser number of shares were outstanding. Figures are adjusted to reflect a 2-for-1 stock split in the second quarter of 1961.

Directors of the company have voted a regular quarterly common dividend of 24 cents a share, payable on or before Mar. 31, to holders of record Mar. 5. The dividend represents an increase of 2 cents a share over the 22 cents paid in the previous quarter.

The dividend boost is the fifth to be ordered in the last four years, according to R. Crosby Kemper, chairman of the board. The indicated annual dividend rate of 96 cents a share on the common stock compares with 84 cents paid in 1961 and 72½ cents paid in 1960.

Honor Elbert Welch in Ind. For 60 Years of Service

Elbert S. Welch, operating vice president of Indiana Telephone Corp., Seymour, was honored by company directors recently for his 60 years of service to the telephone industry.

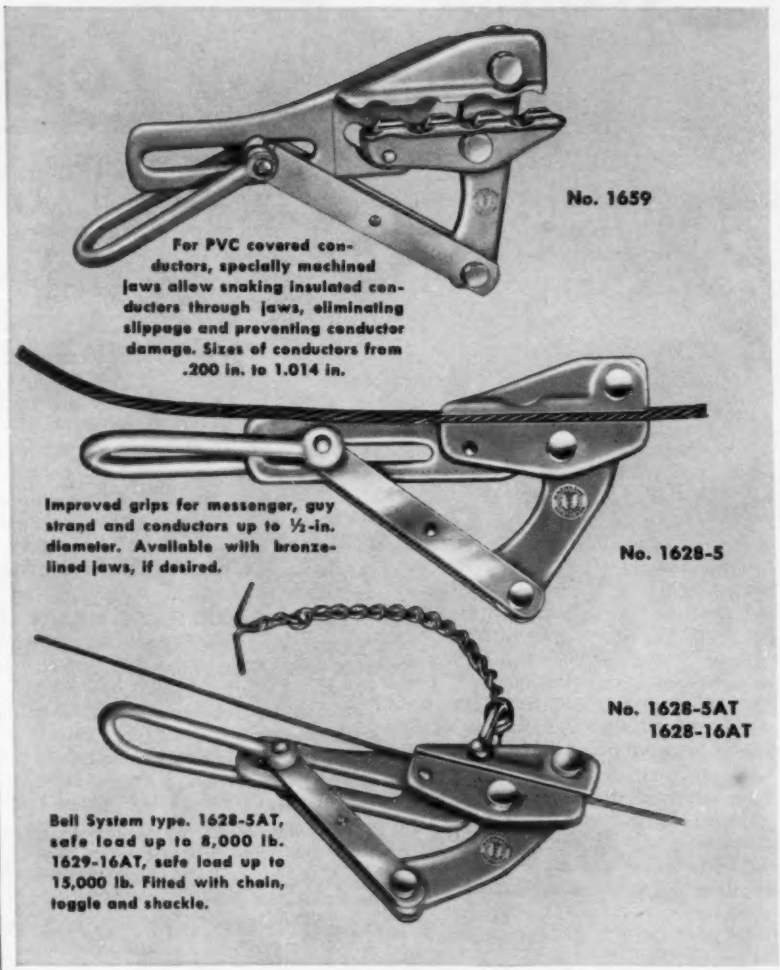
A framed resolution citing Mr. Welch's long service and contributions to Indiana Telephone and the Independent telephone industry was presented at a surprise luncheon. Arrangements for the presentation were made by Pierre S. Goodrich, Indiana Telephone president, and W. J. Scheidler, executive vice president.

Mr. Welch, who remains active in Indiana Telephone management, began his telephone career with the Cumberland Telephone Co. in Tennessee in 1901. He later moved to Seymour, and in 1916 was named general manager of the former Southern Indiana Telephone & Telegraph Co., predecessor of the present Indiana Telephone Corp. He became operating vice president of Indiana Telephone when it was formed in 1935.

He was a founder and first president of the J. K. Johnson chapter of the Independent Telephone Pioneer Association and is a former president of District 7 of the Indiana Telephone Association. Mr. Welch is also a former member of the board of the Indiana association.

A testimonial resolution marking his 60 years in the telephone industry was presented to Elbert S. Welch, right, recently by directors of Indiana Telephone Corp., of which Mr. Welch is operating vice president. The presentation was made by W. J. Scheidler of Greensburg, executive vice president of the company, at a luncheon in Indianapolis.

KLEIN Chicago Grips


No. 1659
For PVC covered conductors, specially machined jaws allow snaking insulated conductors through jaws, eliminating slippage and preventing conductor damage. Sizes of conductors from .200 in. to 1.014 in.
Improved grips for messenger, guy strand and conductors up to ½-in. diameter. Available with bronze-lined jaws, if desired.
No. 1628-5
No. 1628-5AT
1628-16AT
Bell System type. 1628-5AT, safe load up to 8,000 lb. 1629-16AT, safe load up to 15,000 lb. Fitted with chain, toggle and shackle.

Since the first wires were strung, Klein grips have been the accepted standard of public utilities and others requiring a strong, non-slipping grip. Available in over 50 types and sizes with plain jaws or serrated jaws for pulling up solid or stranded wire, for bare aluminum and copper cables, or for PVC covered conductors. If you do not have a copy of the Klein catalog listing and describing the many types of grips—send for one.

SEE YOUR DISTRIBUTOR

Mathias Established 1857 KLEIN & Sons Chicago, Ill., U.S.A.
INCORPORATED
7200 McCORMICK ROAD, CHICAGO 45, ILL.

the Woman's Place

by Dianne P. Drucker
and
Helen Hardin
Associate Editors

THE WORLD of women has expanded far beyond the ancient limitation of "kuche, kinder and kirche" (kitchen, children and church). Today, women are found in almost every profession and trade, including science. And they are welcomed.

One example of how America's scientific organizations open avenues for women interested in technology comes from the telephone industry in the story of Peggy Hazard, a biologist for Bell Telephone Laboratories.

Peggy's one of nearly 3 million women employed in technical or kindred work in this country today, and one of 10,000 female biologists. She's one of 2,500 women employed by Bell Labs and one of the 400 or so who hold bachelor or master degrees in science and mathematics at the Labs.

But Peggy Hazard's work differs markedly from the work being done by these hundreds and thousands of other ladies.

AS A MEMBER of the environmental protection and corrosion group in Murray Hill, N. J., Peggy's job is to "explore the sea."

She studies, examines and conducts all types of biological tests on retrieved ocean cable—cable perhaps 90 years old—which might have been attacked by marine organisms or ripped to shreds by a fishing trawler at sea.

The mysteries of the sea unfold through a microscope and Peggy Hazard's astute knowledge of biology.

For Peggy, an attractive personable blond who graduated a few years ago from Bucknell University, her profession is "challenging".

DURING HER first few years at the Labs, Peggy conducted bio-assay studies of preservatives for telephone poles and other timber products.

Now her work involves studying the effects of marine environment on ocean cable materials. With over 20,000 miles of ocean cable beneath the sea, and thousands of miles of cable planned for the future, knowing what materials will withstand the sea's harmful environment is essential.

Peggy Hazard's job is just one example of a growing policy to hire technically qualified women for important telephone work.

TO DATE, BELL Labs has hired women from more than 100 colleges and universities. Physicists, psychologists, zoologists, audio and speech pathologists, mathematicians, English majors—practically all types have been hired to handle technical work. About the only limitation, in most areas, is the number of job applicants. The Labs personnel division says it wishes there were more applications.

No longer is technology man's exclusive bailiwick.

Peggy Hazard's position is indicative of this. Actually, Peggy just about didn't work for Bell Labs, for she had no idea that a telephone laboratory would need biologists.

•

THE BUSINESS WOMAN, no less than her sister, the homemaker, budgets her time and energies these days, often expending precious after-hours to help others. The reward for helping those who need help can never be measured, but it is gratifying to know that one is giving service where it is truly needed.

The American Red Cross is now calling for volunteers. Here are 10 areas from which the busy woman may wish to choose for her spare time.

(1) As disaster representative.
(2) As disaster nurse.
(3) As first aid instructor.
(4) As a gray lady.
(5) As motor service driver.
(6) As social welfare aide.
(7) As Junior Red Cross community representative.
(8) As public information representative.
(9) As a speaker.
(10) As volunteer nurse's aid.

Contact your local Red Cross chapter for further details.

•

THE PRESIDENT HAS created a "Commission on the Status of Women" within the Department of Labor in recognition of the steadily growing role of women in the nation's work force.

Chairman of the 26-member commission, which is scheduled to report to the President by Oct. 1, 1963, is Mrs. Eleanor Roosevelt.

Main topics to be considered by the commission are as follows:

- New and expanded services that may be required for women as wives, mothers and workers, including education, counseling, training, home services and arrangements for care of children during the working day.
- Differences in legal treatment of men and women in regard to political and civil rights, property rights and family relations.
- Employment policies and practices of the federal government.
- Employment policies and practices, including those on wages, under federal contracts.
- Appraisal of federal and state labor laws dealing with such matters as hours, nightwork and wages, to determine whether they are accomplishing the purpose for which they were established and whether they need to be adapted to changing technological, economic and social conditions.

Bell System Gives Promotion Push to "Shop-by-Phone"

Department store sales are traditionally sluggish during winter's waning weeks; that's why the Bell Telephone System says it chose Feb. 19 to launch its month-long advertising and promotion program to encourage the women of the nation to do their shopping by telephone. Of interest to all telephone companies, the most intensive consumer effort to date for Shop-by-Phone will suggest that whenever the weather's acting up or there are good reasons for staying home, "It's a perfect day to shop by phone."

National advertising in magazines and on network TV will be supplemented by use of local media by associated Bell System companies. Associated companies have merchandised the campaign heavily to department stores across the country, urging them to join the growing trend toward expanded telephone shopping facilities.

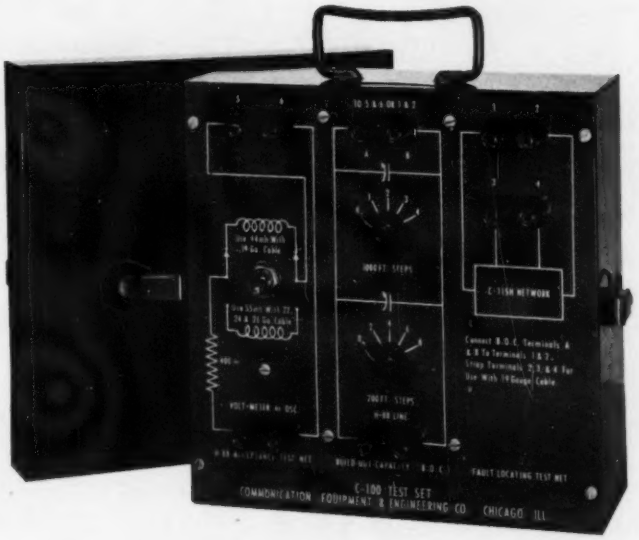
The program has been planned and co-ordinated by the American Telephone & Telegraph Co. and its advertising agency, N. W. Ayer & Son, Inc.

A full-page, black-and-white bleed ad will run in February or March issues of *Good Housekeeping*, *Redbook*, *McCall's*, *Ladies' Home Journal*, *Parent's Magazine*, *House Beautiful* and *House and Garden*, and in the Mar. 24 issue of *TV Guide*. The ad's illustration, a close-up of a dark, rain-spattered window pane, covers the entire page. Its selling message is in reverse type at center: "It's a perfect day to shop by phone."

"The Bell Telephone Hour" for Mar. 16 will carry a one-minute color commercial stressing telephone shopping, within an expanded message: " . . . It's so comforting to know that all it takes is a telephone call to have almost anything you need delivered right to your door. Phoning's such an easy, quick and pleasant way to save time and needless effort. So for shopping, for catching up with friends or relatives. . . or for any other reason, it's a perfect day to use your telephone. . . "

In addition to heavy sales and merchandising efforts, associated Bell System companies have supplied a specially designed Shop-by-Phone symbol for use in department store ads and are offering mats for use by stores promoting telephone shopping. The telephone companies also will run local advertising promoting Shop-by-Phone. Business office displays, radio transcriptions and TV commercials

Check your engineering and installation of telephone cable loading with a



CEECO C-100 TEST SET

The CEECO C-100 Test Set is designed for making acceptance tests and locating loading irregularities on H88 loaded facilities.

- Economical
- Easy to use
- Reliable
- Guaranteed Results

CEECO

Sold by your telephone equipment distributor, or write us for further information.

COMMUNICATION EQUIPMENT & ENGINEERING CO.
5646 West Race Avenue • Chicago 44, Illinois
Phone EStebrook 8-3109

have been made available for local and regional use.

The trend toward telephone shopping received its initial impetus from the economic plight of department stores in the early 1950's. Experiments and studies by AT&T, various associated Bell System companies and N. W. Ayer provided a broad base of knowledge about the operation of telephone-order facilities in large retail stores. The first city-wide consumer promotion for the concept was in Baltimore in 1959. It introduced the now-famous slogan, "Shop by phone when you can't leave home."

AT&T has aggressively promoted telephone shopping to the retail trade since early in 1959. The first national consumer advertisement ran in three women's magazines in March a year later, and several others have appeared since then in limited schedules.

ABC OF THE TELEPHONE

Continued from page 38

pression balance in all cylinders. This also suggests the positive advantage of using upper cylinder lubricant periodically in all units of the telephone fleet.

Irregular compression build-up might also be caused by incorrect valve adjustment, broken valve springs, and similar conditions. The upper cylinder lubricant should be used for a few days, at least, to definitely eliminate sticky valves or gummy rings as the cause of the trouble before proceeding with more expensive repairs.

Cylinder Leakage Tests

Compression can also be checked by introducing air under high pressure into the cylinder area. This test should not be overlooked in planning a series of tests for cylinder leakage. A spark plug adapter is used to direct the compressed air into the cylinder area. The test is made with the piston at top dead center on the compression stroke. The higher the pressure of the air blown into the cylinder, the better the test.

A listing of the various engine troubles that may be revealed by the compressed air test is as follows:

(1) Air bubbling in the radiator indicates a leaky cylinder wall or cylinder head.

(2) Movement of air through the cylinder area and out the crankcase breather pipe reveals defective piston rings; cracked piston or extensive wear of the cylinder wall.

(3) A hissing sound in the carburetor throat usually can be traced to a leaky intake valve.

(4) The sound of air passing into the exhaust manifold most likely would be caused by a leaky exhaust valve.

(5) A leaking head gasket is indicated in one of the following ways:

(a) The subdued hissing sound of air passing into an adjacent cylinder, as shown at A in *Fig. 6*.

(b) Air bubbling in the radiator caused by a leak into the cooling system, as illustrated at B in *Fig. 6*.

(c) The sound of air escaping into the atmosphere. The location of these leaks can be found quite readily.

Tightening Head Bolts

Compression may also be affected by the tightness of cylinder head bolts and the way they were tightened.

Loose cylinder head bolts usually result in premature gasket failure. Bolts tightened too much may cause distortion of the cylinder head. Also, the structure of the engine block may be damaged if the head bolts are too tight.

Cylinder head bolts tightened unevenly may cause distortion of the cylinder walls and valve seats. This will permit valve and piston blow-by that otherwise would not occur. Similarly, unevenly tightened head bolts may cause the head gasket to seat incorrectly. These problems can be eliminated by using a torque wrench to tighten head bolts in accordance with the manufacturer's specifications.

Most engine manufacturers specify the degree of tightness, in foot pounds of torque, for cylinder head bolts. In addition, the manufacturers usually specify the order in which the head bolts should be tightened. These instructions should be followed carefully to avoid unnecessary engine trouble caused by improperly tightened head bolts.

Use New Plug Gaskets

New gaskets should be used whenever spark plugs are removed and reinstalled. The gasket is the sealing agent between the shoulder of the spark plug and the cylinder head. A spark plug gasket, like any other gasket, seals better when new. Reusing gaskets when spark plugs are removed for inspection, cleaning, or readjustment is false economy. A penny or two saved by reusing an old gasket may result in poor engine performance and higher operating costs.

Although spark plugs should be seated firmly, too tight a plug may place unnecessary stress on the cylinder head. Again, a torque wrench should be used to be sure spark plugs are tightened to the tension recommended by the engine manufacturer. This will prevent over-tightening which could damage the cylinder head. The possibility of under-tightening the plugs will also be eliminated.

Check Cooling System

A dirty or partially plugged cooling system may cause local hot spots in the cylinder head or engine block resulting in poor compression. A local hot spot may remain at a temperature many degrees above that of the surrounding engine areas. This causes unusual stress in the engine block and may result in distorted valve seats.

Regular cleaning and flushing of the cooling system is recommended to eliminate valve seat distortion that may be caused by local hot spots. A number of highly effective cleaning agents and rust-inhibitors are available for this important part of the fleet maintenance job.

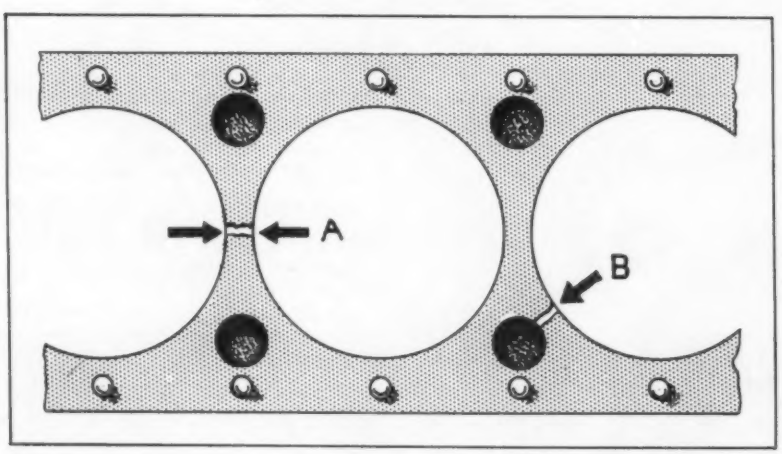


Fig. 6

Reduce Installation and Maintenance – Use...

Abrasion resistant Black High Molecular Weight Polyethylene Jacket saves time and money during installation and reduces tree and shrub-trimming maintenance.

Individual pairs have much stronger mechanical protection, and will afford more uniform transmission characteristics over a wide range of climatic changes. For full information, contact.

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ENTRANCE
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for
OUTDOOR
TELEPHONE
BOOTHS
U.S. Patent No. 2,977,402
TELEPHON
Model TBM Mast provides complete service entrance facilities for outdoor telephone booths with the definite plus advantages of lower cost and easier installation. Raises power lines for specified ground clearance.
FITS MOST BOOTHS
Meets Code Requirements
LOOKS BETTER The TBM Mast is engineered for the job. Adds to the appearance of any booth.
LASTS LONGER Heavy gauge steel tubing used throughout for life-time service. Only heavy duty fittings used.
COSTS LESS Actual installations show savings up to two-thirds over conventional installations.
REMOVABLE Can be moved from one location to another. Simply disconnect lines and pull mast out of ground sleeve.

Utility Service Co., Inc.

1620 THIRTEENTH STREET RACINE, WISCONSIN

Obituary

JAMES L. KILPATRICK, 86, former president of the New York Telephone Co., died on Feb. 13 at his home in New York City.

Mr. Kilpatrick, who was president of the New York company from 1933 to 1941, continued service with the company as a director until 1949. A native of Philadelphia, he began his telephone career in 1896 as a wireman for the Bell Telephone Co. of Pennsylvania, and subsequently, was central office troubleshooter, inspector, special inspector, and chief wireman, then, superintendent of equipment and buildings, a post which he held till 1915.

He served as assistant vice president and general manager of Pennsylvania Bell; and joined Western Electric Co. in 1922. He became vice president and a director of Western Electric, and of the International Western Electric Co., and a director of Bell Telephone Laboratories.

In 1927, he was named vice president of New York Telephone.

Mr. Kilpatrick had been a president of the Telephone Pioneers of America, a trustee of the Franklin Institute, and American Institute of Electrical Engineers, and of the New York Electrical Society.

Survivors include the widow, Amy Bartholomew; two sons, John L. of Orange and James L. Jr., of Short Hills; and three daughters, Mrs. Martin F. Connor, of Philadelphia, Pa., Mrs. Albert E. Heekin, of Cincinnati, Ohio, and Mrs. James J. Grady, of Chestnut Hill, Pa.

To Open First European ECO

Reginald Bevins, M. P., reporting for the British General Post Office on Feb. 13 in a London speech, said that later this year, the Post Office will open an electronic telephone exchange at Highgate Wood. "This," said Mr. Bevins, "will be the first all-electronic public exchange to be tested on live traffic in Europe."

Can't Do It Alone

The Citizens Public Expenditure Survey reports that the taxes actually paid by the 244 persons in the United States with taxable incomes of one million or more are just enough to run the government for 25½ hours—a trifle more than one day. And even if they were taxed 100 per cent, the increase in revenue would merely support the government for another 14½ hours. There just isn't enough money in the big or even the middle income categories to operate a 90-billion-dollar a year government. So the lower income people must pay the bill.

POLITICS

Concluded from page 24

Gen Tel of Michigan, sprucing up our business climate to create new jobs has been, and will continue as a vital political concern. Politics affects our economic well-being at all levels of government.

DECISIONS MADE by public officials determine how much of each year we work to pay for our public purchases. We live our lives under laws enacted by men who were elected through the political process.

We should be particularly eager to allow people with business experience to take part in politics on a bi-partisan basis. Their knowledge of what it takes to run a successful business, particularly from the standpoint of increasing and maintaining employment could have a salutary effect on other lawmakers and many constituents. In grappling daily with business problems, businessmen have gained an insight as to how government could enhance businesses' ability to create more jobs and, as a result, improve the over-all economy.

At General Telephone Co. of Michigan, we began encouraging political participation by employes, as individuals, in the party of their choice, 18 months ago. We offered seven classes of the United States Chamber of Commerce "Action Course in Practical Politics" to a cross-section of employes. It was our experience, from that initial effort, that over one-third of the course participants became active in the party of their choice for the first time. This, we believe, was an excellent response.

WE WILL shortly introduce a course for employes which will combine economic and political education. It will be offered to every employe in the company. We are convinced economic and political education should be a continuing function of management. Our hope for maintaining our private enterprise system is through a public adequately informed on the basic principles of our economic system. Without this body of responsible people, we may forfeit the flexibility and strength of our country from within.

J. T. Clark Named GD/T West Coast Service Engineer

J. T. Clark Jr. has been appointed service engineer for the territory served by General Dynamics/Telecommunication's West Coast branch, according to David Balis, manager of customer service.

Mr. Clark has been an installation foreman for many years, starting with Western Electric Co. in 1953, after

PARSONS® 77

You can cut costs for ditching and laying cable to 1½¢ per foot*

Here's how...

First, get yourself a Parsons® 77 Trenchliner®... You can easily get up to 21 lineal feet of trench per minute. You can work anywhere because the 77 is not much wider than a yardstick. With 32 hi-lo digging selections, any kind of ground is a cinch. The ladder-type boom digs to 5′ depths, 6″ to 18″ wide. Starts cut fast. Holds accurate grade. Handles vertical set-in work and undercutting with ease.

Second, add a special cable laying device... Designed for the fast action of the 77. Equipped with rubber wheeled cable feeder to give absolute protection. Cable is laid automatically without a pause or problem.

**The cable installation department of a major telephone company gives the 77 Trenchliner credit for reducing their cable laying costs from 5 to 9 cents per foot down to a low, low 1½¢ per foot.*

PARSONS COMPANY
A Division of Koehring Company
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Rush full data on the 77 Trenchliner

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TEL-P203

J. T. CLARK JR.

completion of service duties with the U. S. Navy. From 1955 through 1959, as a Stromberg-Carlson foreman, he was in charge of large XY dial and toll ticketing installations such as the offices at Tipton, Ind.; Manassas, Va.; and Elyria, O. On completion of the Elyria project, he accepted a position as engineer with the Mid-Continent Telephone Corp. at its Elyria headquarters.

Jay Clark was born in Antelope, Tex., and attended Bellevue, Tex. schools. He is making Portland, Ore. his operational base for service to the nine western states included in this territory.

GT&EI Sets Up Lebanon Office; Eggerickx Manager

An office in Beirut, Lebanon was established recently by General Telephone & Electronics International. The company states that this office was opened to provide more direct service to telephone administrations and other customers in North Africa and the Near and Middle East.

Beirut, a city of 400,000, is the financial capital of the Middle East, and is readily accessible to all countries in the territory.

The Beirut regional office is under the direction of GT&E International S.A., Geneva, Switzerland, which previously served the area directly.

Daniel Eggerickx is general manager of the new office. He was formerly departmental marketing manager at the Geneva office. Mr. Eggerickx joined Automatic Electric International in 1957 as the resident engineer in Portugal.

Now serving as technical director for the Beirut office is Farah I. Rafidi, who has been resident engineer for AE International in Lebanon.

DANIEL EGGERICKX

Zeissett N.Y. Representative For Reliable Electric

Donald R. Zeissett has joined the sales staff of Reliable Electric Co. He represents Reliable, both power and telephone products, in New York state with headquarters in Highland, N. Y., reporting to Arthur Kelley, district manager.

D. R. ZEISSETT

Mr. Zeissett has had extensive engineering experience with the Central Hudson Gas & Electric Corp. where he was previously employed for nine years. His field of experience covers the design and engineering of transmission lines and structures, distribution facilities, consulting, system engineering and work on new materials, specifications and electric construction standards.

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TROUBLE CLEARING

Concluded from page 22

wise a high voltage coming in from the line would strike the heat coil first and the winding of the heat coil would probably be burned open. A continuation of the high voltage would not be drained off by the carbons. In the case of lightning with its steep wave front, the reactance of the heat coil may cause a dangerous arc at that point.

A protector has two pairs of punchings. A pair of short punchings at the rear of the protector, one on each side, to which the cable pair is connected and a pair of much longer punchings, both on the right side of the protector, to which the jumper is connected. Therefore if a type B protector is used on an A-type frame it will be quite impracticable to connect the cable to the long punchings and the jumper to the short punchings.

We have seen several cases where a B-type protector was used on a type A frame. In each case we found that due to the difficulty outlined above, the protectors were connected reversed. When a company with an A-type frame orders protectors or protector parts, they should state that they are to be used on an A-type frame. When they arrive, they may be checked by tracing the long punchings. They should connect to the outside carbon blocks.

In addition to protection from currents and voltages that come from the outside plant, the central office must be protected from excessive currents coming from its own power plant—battery current and ringing current. This and the use of fuses in addition to the M.D.F. protectors will be discussed in our next article.

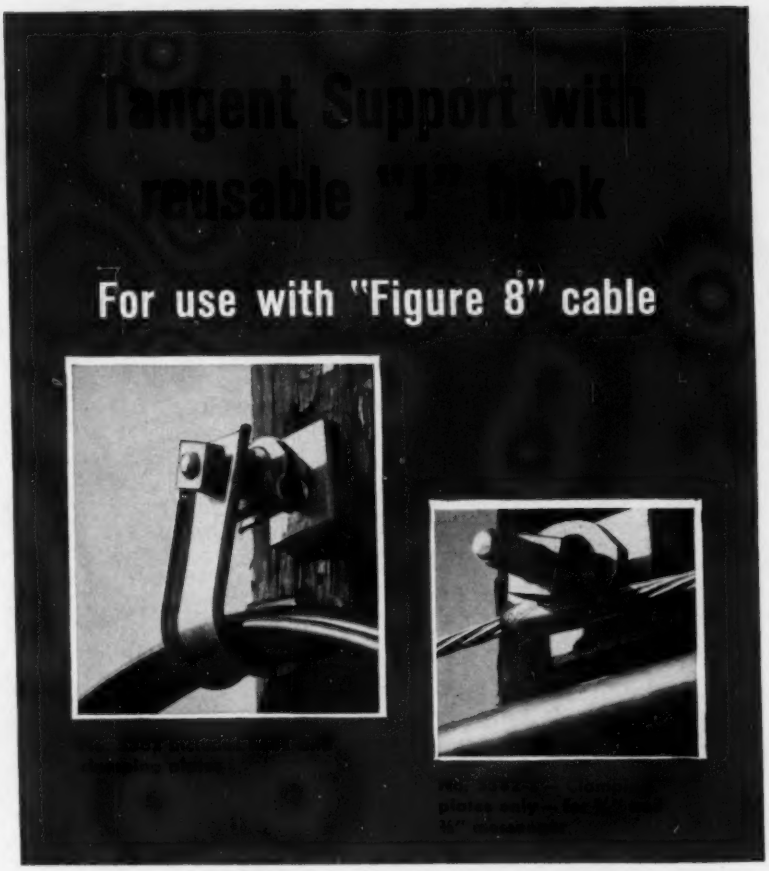
G-E Telecommunications Organization Is Formed

The General Electric Co. has created a new telecommunications marketing organization within its communication products department in Lynchburg, Va.

Primarily concerned with point-to-point communications, G-E Telecommunications will be responsible for the engineering, sale, installation and maintenance of microwave radio and carrier-multiplex systems.

Walter E. Sutter, formerly manager of microwave systems sales and services, has been named manager of G-E Telecommunications systems sales and services.

G. R. Petersen, manager of marketing for the G-E communication products department, said G-E Telecommunications has evolved from the



The Reliable all stainless steel Tangent Support No. 5582 can be used in either of two ways:

1. Leave the hook in place after installation →
2. Place the clamping plates on the through-bolt first and the "J" hook last in a reverse position. After tensioning and installation, remove and reuse the "J" hook. The lock-washer design embossed in the clamping plates assures a tight grip.

Rolled edges on the "J" hook positively prevent cable or strand damage. The clamping plates cannot bite through the webbing between strand and cable.

Convince yourself of its merits:

Reliable

A Symbol of Integrity Since 1909

ELECTRIC COMPANY

Franklin Park, Illinois

Send me a sample of your Tangent Support No. 5582 with Installation Specification No. 116.

NAME _____ POSITION _____

COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____

TAKE A BIG STEP TOWARD **SAFETY** WITH **DUO-SAFETY LADDERS**

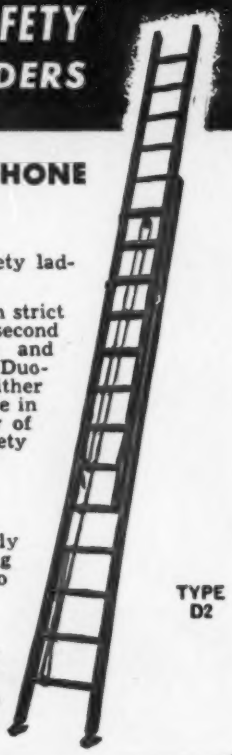
... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!



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"HELLER GRIP" STAPLERS

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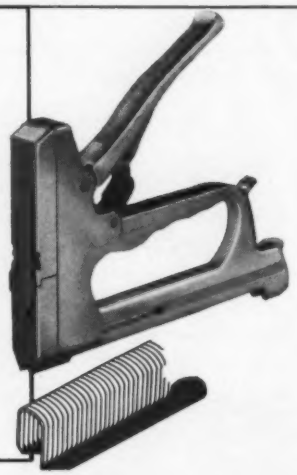
STAPLES



HELLER GRIP **STAPLERS**—Most complete line of wire stapling guns on the market! For any fastening job . . . telephone, electronic or low-voltage electrical. Securely and automatically fasten braided, jacketed or stranded wire, tubes or cables. Protect wire while they tack it. *Request Catalog TKL.*

heller-ply **STAPLES**—Rust-proof, corrosion-proof, salt-water-proof. Won't stain or run. Biggest staple advance in 25 years. Steel base, copper-electroplated for lifetime protection. Cost only half as much as staples made of Monel, stainless steel or other expensive metals. *Request Catalog SPHP.*

A-6531A

If it's a HELLER it's tops in its field

HELLER ROBERTS
Instruments Corporation
6115 Carnegie Avenue • Cleveland 1, Ohio

company's former microwave systems organization.

Like the former microwave group, G-E Telecommunications will have complete responsibility for a microwave contract, from the initial sale until after the system is on the air. To perform this integrated service for customers, Mr. Sutter has formed three unit operations—sales, systems engineering and customer services.

Wayne Evans has been designated as manager of headquarters and field sales. Individual product line responsibility has been assigned to F. L. Harper as systems sales manager in the new organizational structure, and A. W. Newman as carrier sales manager.

Peter Smee has been appointed manager of systems engineering in the new organization, and Al Caldera has been named customer services manager.

NATION'S CAPITAL

Continued from page 18

disapproval resolution—H. Res. 530—by Meader, (R., Mich.). Chairman McClellan (D., Ark.) announced Senate Committee hearings for Feb. 14 on S. Res. 288 (McGee, D., Wyo.); Senate floor debate started February 19. Expectations are that the House will wait to see what the Senate does.

TAXES: The House Ways and Means Committee last summer spent many weeks considering tax reform. It wound up by drafting a bill, but shelved it until this year. The bill is expected to be approved by the committee. It would provide, among other things, for withholding of dividends and interest at the source, and for an 8 per cent tax credit for money reinvested in plant modernization, but with only a 4 per cent credit for utilities.

The bill also would tighten up foreign income provisions of the present law, would clamp down on entertainment expenses, would provide a new treatment for gain from sale of depreciable business property, would provide new taxation for cooperatives and mutual fire and casualty insurance companies, etc.

The changes are estimated to produce additional revenues of about 900 million dollars and a revenue loss of more than 1.1 billion dollars—a net loss of 200 million dollars. The committee refused to go along with an administration request for repeal of an individual's dividend credit and dividend exclusion, and took no action on pleas from business for a statutory substitute for the present administratively-determined "Bulletin F" depreciation allowance.

WELFARE-PENSION: The House and Senate approved H. R. 8723 and

S. 2520 to "strengthen" the Welfare and Pension Plans Disclosure Act to make bribery, embezzlement or false statements about employe benefit plans a federal crime. The bills would give the labor department vast power to require certain new reporting standards; they also would give the labor department power to evaluate use of welfare and pension funds.

WELFARE: The House Ways and Means Committee started hearings Feb. 7 on H.R. 10032, by Chairman Mills (D., Ark.), to make a series of "improvements" in the federal welfare programs requested by President Kennedy. The President, in a special message to Congress, said new legislation is required "if our state operated programs are to be fully able to meet modern needs." He said the states should be encouraged by the offer of additional federal funds to strengthen and broaden the rehabilitative and preventive service they offer to persons who are dependent or who would otherwise become dependent.

MEDICAL CARE: The House Ways and Means Committee completed hearings last year and deferred further consideration of the administration's plan for medical care for the aged under Social Security, H.R. 4222 (King, D., Cal.). The proposal would provide limited hospital, nursing home, diagnostic and home health care service for individuals over 65 who are entitled to Social Security benefits. The program would be financed by increasing the social security tax rate by one fourth per cent on both employers and employes.

PUBLIC WORKS: Liberal-minded senators hope Congress will give the President authority to make grants to communities for public works. Mr. Kennedy specifically endorsed this type of spending, as set forth in S. 986 by Senator Clark (D., Pa.).

UNEMPLOYMENT COMPENSATION: H.R. 7640, by Representative King (D., Cal.), would carry out the administration's recommendations for permanent authority to pay additional unemployment compensation to states which have exhausted their regular benefits during a recession. The bill would extend coverage to an additional three million employes of small firms. Federal standards would be set up—payments for up to 39 weeks at one-half the average weekly wage in the particular state.

STOCK OPTIONS: S. 1625 would terminate special tax treatment now accorded certain employe stock options. Senate Finance Committee held hearings. An unsuccessful attempt was made to attach this bill as a rider to a tax measure.

COMPANY RECORDS: The Senate

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has passed S. 167, which would require a company to produce its records for an anti-trust investigation. The records would be kept secret, "providing nothing herein shall prevent the attorney general from making available the material for examination" by the Senate and House Judiciary Committees. The House Judiciary Committee has also approved S. 167.

PRE-NOTIFICATION: A House Judiciary Sub-committee has held hearings on H. R. 2882 to require pre-notification to government agencies (60 days in advance) of mergers by companies which have more than 10 million dollars of combined assets. S. 166 was sent by the sub-committee to the full Senate Judiciary Committee without recommendations.

LOBBYING: H.R. 640, by Boggs, (D., La.), to exempt from taxation the cost of certain legislative activities, is before the House Ways and Means Committee. An identical bill was approved by the committee last year. The original Boggs bill of last year was introduced by Senator Hartke (D., Ind.) (S. 467). Senator Capehart (R., Ind.) has introduced S. 1613, a companion bill to H.R. 640.

BURNS CREEK DAM: The House Interior Committee rejected 17 to 14 H.R. 378, which would have established a precedent for federal electric utility responsibility.

PATENTS: The Senate Judiciary Sub-committee completed hearings last year on S. 1084 sponsored by Senator McClellan (D., Ark.), and S. 1176 introduced by Senator Long, (D., La.), to require government ownership of all inventions resulting from government research and development contracts. The House Space Sub-committee is considering two bills-H.R. 1934 and H.R. 6030, which would give the administrator of the National Aeronautics and Space Administration (NASA) greater discretion in taking title to inventions or permitting contractors to retain title thereto. The Senate Space Committee held hearings on S. 1857, companion to H.R. 6030. The administration is attempting to develop a government-wide patent policy bill.

NATURAL GAS ACT: Chairman Harris (D., Ark.) of the House Interstate and Foreign Commerce Committee has introduced H.R. 7575 to amend the Natural Gas Act. The bill would prohibit utility-type regulation of natural gas producers, thus ruling out cost of service approach in establishing producer rates, and would establish the cost of treating producer gas as a commodity and stipulate that a just and reasonable market price be established. A related bill, S. 2744 has been introduced by Senator Magnuson, (D., Wash.), chairman of the Senate Commerce Committee.

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2—4/4—4/2—2

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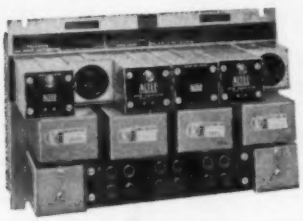

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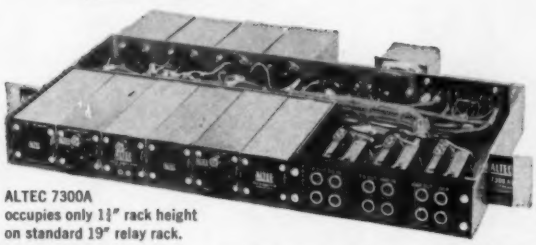

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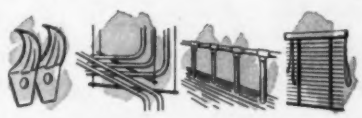

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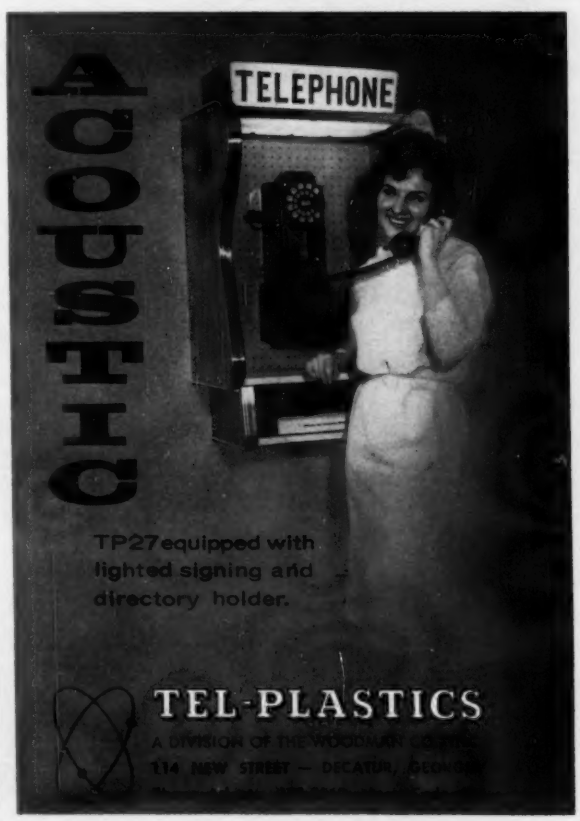

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J. W. SHREINER

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